AMERICAN JOURNAL OF OPHTHALMOLOGY

Vol. 8 FEBRUARY, 1925 No. 2

CONGENITAL ZONULAR OPACITY OF THE CORNEA.

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The condition here described was discovered when the eye was examined following a slight injury. No change occurred in it while under observation, ten months. In the central zone of the cornea many faint yellowish brown granules were seen which appeared almost white under the slit lamp. This zone was marked off from clear cornea by a faintly opaque line. The condition was confined to the anterior layers of the true cornea. The appearances are shown in plates 5 and 6. This case was shown before the New York Academy of Medicine, Dec. 17, 1923.

While the study of unusual corneal lesions, congenital or acquired, is always of absorbing interest, a peculiar type, so rare as to defy classification, seems particularly worthy of recording. It is with this understanding, that I am led to present the following case report.

A man, H. J., aged 30 years, was first seen on February 6th, 1923, complaining of headache and reduced vision in the right eye. This, he claimed, had come on two weeks previously, when the flat side of a piece of wire-strapping struck the eyeball and upper lid. He had consulted his physician, who had prescribed "argyrol drops." The eye had been moderately inflamed and painful, but now had become rapidly improved. He insisted that the vision of each eye had been normal previous to the accident, but here the motive for such a statement, in lieu of the medicolegal aspect of the case, lends color to the problem of cause and effect as well as to the character of the lesion.

He is a strong healthy looking Russian Jew, and a bookkeeper by occupation. His family history and previous medical history gave no clew to any inherited or medical relationship to his present ocular condition. His father and mother are living, and there is no ocular defect or physical abnormality in the family so far as he knows. He has been married seven years, and has a son, four years of age, who is perfectly normal.

On examination, there was a small partly healed, superficial laceration of the upper lid of the right eye, otherwise the lids were normal; no swelling or redness or ecchymosis. The conjunctiva was normal, and there was no injection, superficial or deep. Directly over the upper portion of the pupillary area of the cornea, there was an irregular triangular shaped abraded area, slightly elevated, faintly opaque and quite superficial. The rest of the corneal substance was clear and transparent except for a disciform arrangement of what appeared to be fine yellowish-brown granules, equally and regularly distributed over the entire pupillary area and covering a portion of the iris area for an extent of about 1 mm. (Fig. 1). Under oblique illumination and the Zeiss binocular loop, these granules are seen to occupy the superficial layers of the substantia propria and to be sharply delimited or marked out, as it were, by a faintly white crayon like line of opacity drawn about the margins of the granular disc, as the drawings presented illustrate. Under high magnification with the slit lamp microscope, these granules appear as round, almost snow-white (with the faintest yellowish tinge) quite refractile bodies. They possess no light reflecting surfaces. Some are smaller than others, ranging in size from one to three times the size of a red blood cell, each standing out alone in clear corneal substance and remarkably distributed equidistant from each other (Fig. 4). There is no tendency to clumping or bunching of these bodies in any part of this peculiar corneal zone. They are equal-

ly distributed in the superficial layers of the substantia propria, are less numerous at the periphery, where the thickness of the zone is only one, or at the most two, of these small bodies, while in the central portion the thickness is calculated by the presence of as many as six of these granular bodies in the antero-posterior plane (schematic cross section, Fig. 3). The faintly opaque crayon like line about the margin of the granular disc may be described as similar to that of nebulous opacity of the cornea and is located in the plane of the most superficial layer of the granules. It extends along the entire upper border and nasalward to become discontinuous at the extreme nasal margin, where it is broken into two small sections, then passes continuously along the lower border, becoming indistinguishable or absent along the extreme temporal margin of the granular disc (schematic magnification Fig. 2). The posterior layers of the corneal stroma were clear and transparent, and the posterior corneal surface was free and clear of any deposits. The anterior chamber was normal and the aqueous was clear. The iris was brown in color and normal in every way. The pupil was round, regular and reacted normally, and there was no trace of a persistent pupillary membrane.

Examination of the left eye was negative in every respect. The cornea was clear and transparent, not the slightest suggestion of any deposit similar to that of the fellow eye could be found. Under the slit lamp microscope three small irregular very faint opacities of the cornea were observed, evidently the site of an old involvement (foreign body?) and apparently of no importance.

Vision of the right eye = 20/70+, with —1.25 cyl. 90° = 20/50; vision of the left eye = 20/40, with —1.25 cyl. 75° = 20/16.

In the course of a few days the corneal abrasion was entirely healed, and no evidence of its presence can be noted at this time. The usual laboratory investigation of the blood and urine, including the Wassermann test, has proved to be negative. The blood chemistry report, however, was as follows: Blood sugar 104.9 mg. per 100 c.c.; uric acid 5.00 mg.; urea nitrogen 15.00 mg.; and cholesterol 240. mg. per 100 c.c.

A thoro physical examination was negative. No rudimentary structure or other abnormality could be found.

Alteratives (potassium iodid and biniodid of mercury) and stimulating and eliminative measures have been administered for the possible systemic effect. Also hot fomentations were prescribed; and from time to time drops of dionin 10%. Also a 2% solution of dionin dissolved in pure glycerin (Price's) was tried. Finally a series of five subconjunctival injections of 2% salt solution was given. Not the slightest appreciable effect upon or change in the corneal defect has been detected during a period now of ten months observation.

Naturally in such an unusual case as this, one is interested in and questions, (1st) the cause, (2nd) the symmetry of the lesion, (3rd) its development, (4th) its character and finally, (5th) the prognosis.

A careful review of the literature does not offer any group of cases into which it may be classified, nor have I been able to find a case report of a corneal lesion similar in character and symmetry to that reported above. Suffice it to say, that a study of this review leads to a differential diagnosis from the following conditions: (1) disciform keratitis; (2) corneal degenerations (hyaline deposits, family degeneration, nodular keratitis); (3) hematoidin deposits from hemorrhagic infiltration; (4) corneal lesions associated with systemic disease, such as Addison's disease (Meesmann), dermatitis (icthyosis) (Kraupa), multiple sclerosis (Salus), lead poisoning (Elschnig), and malnutrition, etc.; (5) local staining from deposits of chemicals described as the result of treatment or accident; and finally (6) congenital abnormalities.

It differs from socalled disciform keratitis, which I believed is now regarded as a form rather than an etiologic

clinical entity, in that the distinct pigmentation and character of the granules is not observed in the latter, altho it may be looked upon perhaps as a degenerative or depository change following upon a previous disciform keratitis, the faint crayon like line about it marking the limits of the previously active involvement.

As a form of corneal degeneration, it seems sharply differentiated because of its location in the deeper layers of the substantia propria, and because of its symmetry of form and its presence in a normal eye. Hyaline deposits (Drusen) occur on Bowman's membrane and on Descemet's membrane, are irregular in shape, asymmetric, (Elschnig, Hassall, Henle), and always become calcareous eventually (Leber, Sachsalber). If it be a primary hyaline degeneration of the cornea, it must be recognized as a very rare condition, indeed. Nodular opacity of the cornea is similarly differentiated (Treacher Collins).

Blood staining of the cornea usually occurs in badly injured and degenerated eyes, and the manner of its occurrence, the location in the superficial or posterior layers, its irregularity with the formation of hematoidin, the granules of which are very small and vary in color, does not classify the lesion under consideration.

Hudson's brown line, observed in cataractous eyes, in glaucoma and keratoconus is obviously differentiated.

Corneal change associated with certain systemic diseases seems to be ruled out, because of the negative medical history and the present excellent physical condition of the patient. However, it is interesting to note in this connection that the cholesterol content of the blood, shown in the blood chemistry report, is 240 mg. to 100 c.c., almost twice that of normal. Cholesterol deposits are known to occur in the aqueous, rarely in the cornea and lens, and then almost invariably are associated with the presence of the crystals in the aqueous and vitreous. Furthermore, they are totally unlike the appearance of the spheroidal bodies observed in this case.

Local staining from deposits of chemicals, lead, iron, silver, copper, anilin dyes, etc., is invariably irregular in outline, is usually homogeneous in structure and is associated always with dense opacity of the adjacent corneal substance entirely unlike the appearance of the lesion under discussion.

Finally, it seems most likely that this singularly symmetric and regular distribution of these granular bodies in the cornea is in some way dependent upon an abnormality, embryologic in structure and in form. This is especially significant when viewed with the slit lamp corneal microscope, when these brownish granules appear as white spheroidal bodies, penetrated by the intense illumination and showing the faintest yellowish tinge. Because of their appearance and arrangement one is impressed with their similarity in structure to cellular bodies, and therefore their embryologic significance. Furthermore, this zonular opacity of the cornea seems analogous to zonular cataract, not only in form and symmetry but also to some extent in structure. The embryologic cells failing to develop normally in the lens are believed to undergo a degenerative change. And according to students of this subject, at the time of closing off of the lens vesicle, and cleavage of the mesodermic tissue with formation of the anterior chamber (occurring about the sixth week) uveal pigment may pass over into the external layer of the mesoderm when the pupillary membrane lies in close proximity to it. Traces of a pupillary membrane are frequently associated with the corneal abnormality.

The mystery of the faintly opaque line about the granular disc lends interest to the picture. It is *invisible* to the *naked* eye, and almost so under the Zeiss loupe, in fact so faintly visible that unless it were so perfectly drawn about the zone, it might escape detection from a casual examination of the lesion. Its presence and appearance rather strengthens the impression of a congenital anomaly. Let it be understood that this faint crayon like line is far too delicate in structure, too regular and too precisely delimiting the granular zone to be mistaken for a line of cauterization or the confining margins of an old ulcer.

Nine cases of pigmentation of the cornea, definitely classified as congenital abnormalities and which may be differentiated, have been reported, Krukenberg (three cases), Stock, Thompson and Ballantyne, Kraemer, and Holloway (three cases). Unfortunately these cases of congenital spindle shaped or oval corneal defects were reported before the advent of slit lamp microscopy, otherwise the more exact cellular character of these lesions might have been studied. These yellowish-brown granules as they appear under the usual oblique illumination before the Zeiss binocular loupe, when observed under slit lamp focal illumination before the microscope, may appear as almost snow-white cell like bodies (with the slightest cream like tinge)—an observation which was found to be surprisingly true in the study of the author's case. It may be, therefore, that these spindle shaped lesions referred to are incompletely formed zonular opacities of the cornea, some of them more pigmented than others and explained as occurring at the time of cleavage of the mesodermic tissue during the sixth week of fetal life.

In view of these studies it would seem reasonable to conclude, that we have here a case of zonular opacity of the cornea made up of opaque (slightly pigmented?) cell like bodies, embryonic in origin, and analogous to congenital zonular opacity of the lens. The lack of any evidence of similar changes in the cornea of the fellow eye, and the absence of traces of a pupillary membrane or any other ocular or physical abnormality, while not essential, throws the only doubt upon such a conclusion. In any event it does not seem possible that a simple abrasion of the cornea eleven days previously could be regarded as the cause or in any way contributory to the development of this rare defect.

I wish to express my thanks to Dr. J. M. Wheeler, Dr. Bertha Drapkin, and Dr. Edmund E. Blaauw, who have also observed this case under the slit lamp microscope, for their interest in and suggestions as to the character of this very unusual congenital abnormality.

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ROENTGENOGRAPHY OF THE OPTIC FORAMEN IN TUMORS AND DISEASES OF THE OPTIC NERVE.

J. VAN DER HOEVE, M. D.

LEIDEN, HOLLAND.

Recent literature has called attention to the practical importance of tumors of the optic nerve. Important information may be gained in these cases from radiograms showing the size of the optic foramen. A case of neurofibromatosis causing enlargement of the foramen and great narrowing of one field of vision and loss of the other is here reported. Operation enlarging the foramen of the better eye was followed by considerable recovery of the field of vision. A case is also reported of endothelioma arising from the sheaths of the optic nerve, the foramen was not enlarged. Removal of the orbital tumor was followed by no evidence of recurrence. Literature regarding the size of the optic foramen is reviewed. Great care must be taken in such studies to avoid mistakes as to the real size of the opening.

Tumors of the optic nerve and its sheath have aroused, of late, a great interest among practitioners of different branches of medical science. They may be found in the orbital as well as in the intracranial part of the nerve. The orbital newgrowths belong in the field of action of the ophthalmologist, whereas operations on the intracranial tumors are to be performed by the general surgeon or the special neurosurgeon.

The ophthalmologist can approach the orbital tumors thru the soft tissues, or by temporary resection of a part of the bony orbital wall. The first operation should always be done by an ophthalmologist. The second operation depends on the surgical dexterity, experience and conscience of the ophthalmologist, as to whether he will do the operation alone or with the aid of a surgeon. The Kroenlein operation and its modifications are better not done by a surgeon alone, for the contents of the orbit are so especial and delicate that only one who is accustomed to deal with them should operate on the orbit. The operation on the optic canal is so purely surgical that it is not advisable for an ophthalmologist to perform it.

The optic nerve canal can be approached by the frontal way, i. e., Schloffer's[1] operation; by an orbital way, as Hildebrand[2] does, or by a lateral way, as Dandy's[3] operation.

It is a well known fact that tumors of the orbital part of the optic nerve can involve the intracranial part, thru the optic canal, whereas the intracranial tumors can grow out thru the optic canal toward the orbit. Consequently it is no wonder that neurosurgeons and general surgeons have an interest in optic nerve tumors, as well as ophthalmologists. We find excellent studies on this subject from Byers[4] in 1901 and Hudson[5] in 1912, which cover the whole literature prior to those dates. In the last years have

Fig. 1. Case I Neurofibromatosis showing tumors connected with the skin.

appeared publications from neurosurgeons, as Dandy; and from ophthalmologists, as Verhoeff[6], Benedict[7], von Hippel[8], and Van Duyse[9]; and Martin and Cushing[10] add, in a highly important article, quite a new chapter on the primary gliomas of the optic chiasm.

Tumors of the optic nerve and its sheaths are very rare. A considerable part of them (Dandy counts 21%) involves the intracranial, as well as the orbital part of the nerve. Many cases are known in which, in spite of an incomplete removal of the tumor, no re-

currence followed. So it seems, as a rule that these tumors are not very malignant. For prognosis and therapy it is of considerable value to determine whether the tumor involves the optic canal or not. It may be very difficult to find this out, but I believe that

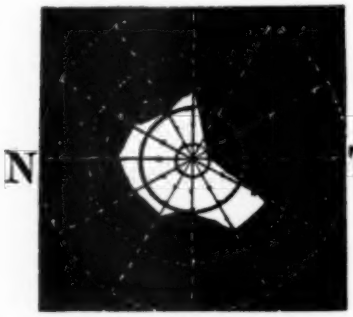

Fig. 2. Case I Field of vision for left eye, November 1922. N, nasal; T, temporal side.

radiography will be of use to us in making this diagnosis; just as in cases of pontine tumor, or in a new growth of the acoustic nerve. We often make the diagnosis of enlargement of the inner ear canal with the radiogram.

Tumors of the optic nerve can enlarge the optic canal very considerably as we see in Dandy's publication; and I am thoroly convinced, that it must be possible to observe this on Roentgen photographs.

The Roentgen ray photography of the optic foramen was introduced in ophthalmology by de Kleijn and Stenvers[11], who have observed that in roentgenographs of the ethmoid by Rhese's method, we get excellent images of the optic foramen and of the ethmoidal fissure. They have shown us, how in this way, we can find fractures, fissures and callus conditions on the walls of the optic foramen.

Since that time I have used this method to examine, in cases of tower skull, whether the optic foramen is of normal size and form. In case of choked disc in tower skull, I should advise trephining if the optic foramen is normal. If the foramen is abnormal, we can think about operation on the optic canal.

We see in Dandy's cases, how difficult it is to make the diagnosis of an intracranial tumor of the optic nerve, whereas the figures in this article show with certainty, that in both cases, enlargement of the optic canal must have been present, in such a degree that it would have been revealed by an X-ray photograph.

Dandy writes, "The diagnosis of a prechiasmal tumor of the optic nerve is at present none too sharp and at best there is an element of uncertainty." Consequently every sign that can facilitate this diagnosis is worth while.

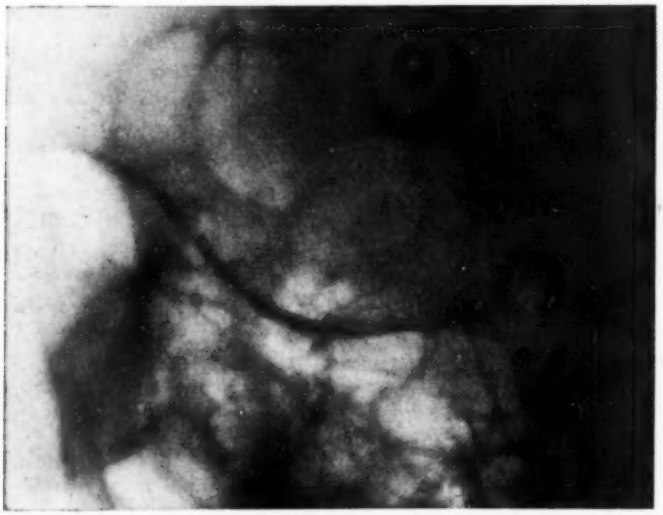

Fig. 3. Radiogram of normal orbit. O, Optic foramen; S, sphenoidal fissure; W, wall of orbit.

The first time that I looked for such an enlargement was in a case of Recklinghausen's disease (multiple neurofibromatosis).

NEUROFIBROMATOSIS OF THE OPTIC NERVE.

CASE 1. The patient, a woman of 37 years, was referred to us for defective visual acuity, on November 4, 1922. She had on her face (Fig. 1) and on different places of her body multiple tumors, which histologically proved to be neurofibromata. The acuity was defective since youth and diminished very slowly. The right eye was totally blind and squinted considerably. The left eye had visual acuity 2/10, hypermetropia 3 D. and a restricted field (Fig. 2). The discs in both eyes were atrophic, without absolutely sharp limits. Moreover, I found in the blind eye small retinal tumors as seen in cases of tuberculous sclerosis of the brain and Recklinghausen's disease.[13]

Affections of the optic nerve, as choked disc, optic neuritis, and atrophy

Fig. 4. Radiogram of left orbit in Case 1 showing: O, enlarged optic foramen; S, sphenoidal fissure; W wall of orbit.

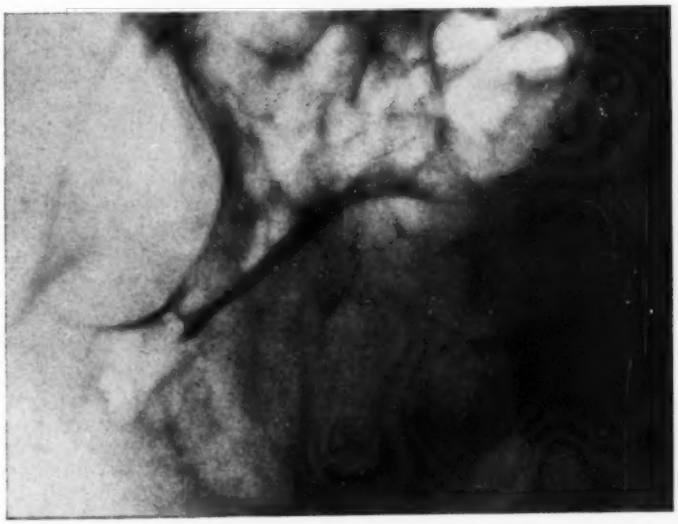

Fig. 5. Radiogram of right orbit in Case 1 showing: O, enlarged optic foramen; S, sphenoidal fissure W, wall of orbit.

are reported in Recklinghausen's disease. I think it probable that some of those affections may be caused by tumors which press the optic nerve, i. e., in the optic canal, or by neurofibromatosis of the optic nerve. In both cases it is probable that the optic canal becomes enlarged; therefore I asked the Roentgenologist, Dr. Weenhuis, of the Leiden University Hospital to make radiograms of the optic canal of our patient.

These X-ray photographs show on both sides a considerable enlargement of the optic foramen. Compare Fig. 3, the image of a normal foramen with Fig. 4 the image of the left and Fig. 5 the image of the right foramen of our patient. We see that the foramen of

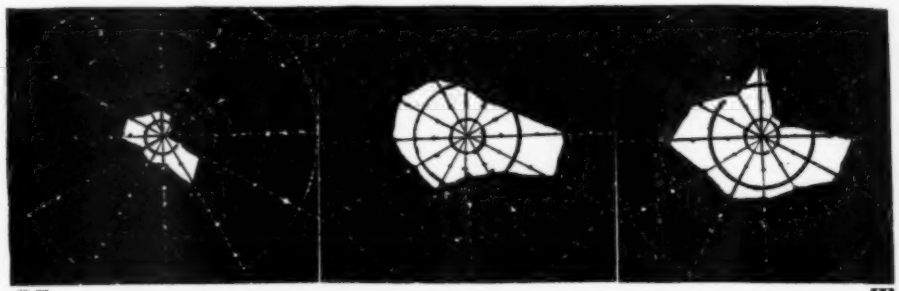

Fig. 6 Fig. 7 Fig. 8

Fig. 6. Visual field of left eye, May 30, 1923 before operation.
Fig. 7. Visual field July 3, 1923 two weeks after operation.
Fig. 8. Visual field L., October 2, 1923, four and one-half months after operation.

Fig. 9. Case 1. Visual field of left eye taken on Bjerrum's screen, May 30, 1923 before operation.

the blind right eye is still much larger than that of the left, moreover the whole surroundings of the right foramen is wrapped in a shadow, perhaps caused by a big tumor.

The X-ray photographs were taken several times, and always with the same result,[14] and we could determine positively for the first time, by X-rays, a considerably enlarged foramen.

if the optic foramen was absolutely too small or too much deformed.

As the visual power of the seeing eye of my patient diminished in such a way that absolute blindness was to be feared, I did not dare to wait any longer and advised operation. I asked Prof. Laager to do the operation. Dandy had described finding the way to the optic foramen, and to act there according to

Fig. 10. Case 1. Visual field of left eye, June 30, 1923.

The next question was, is it necessary to operate on this foramen? As the affection had lasted many years and advanced very slowly in the last years, and as the foramen did not show any change in different X-ray photographs, we felt sure that progression was very slow; and I, therefore, did not advise operation until in May, 1923, when the visual acuity diminished to less than 15/100 and the visual field decreased rapidly (Fig. 6).

Some time before I had conferred with the Director of the Leiden Surgical Clinic, Prof. Dr. J. H. Laager, as to operation on the optic canal, in cases of tower skull, or of retrobulbar neuritis,

the circumstances, either in enucleation or decreasing a tumor, if present, thus giving more room to the optic nerve, even if no circumscribed tumor but a diffuse neurofibromatosis were present.

On the 18th of June 1923, Prof. Laager thoroly opened the skull at the lateral side by circumcision of a skin and bony flap, and found his way to the left optic foramen.

A circumscribed tumor was not found but the optic nerve was much thicker than normal and had about three times the normal volume. Tho it had been easy to explore the chiasma and the other optic nerve, we did not dare to

lengthen the operation unnecessarily. It is highly probable that on the other side the same affection was present only on a still larger scale.

The optic nerve was compressed in the optic canal. Prof. Laager circumcised the part of the dura which lies on the optic canal, turned this dura flap backwards, removed the roof of the optic canal with hammer and chisel and split the dura flap and the dura of the optic nerve in the canal. The optic nerve presented thru the bony canal, showing how much it had been pressed.

The result of the operation was in the beginning very good. The visual field increased considerably, by July 3rd, as shown in Fig. 7. On July 9th the visual acuity was increased to more than 2/10, nearly 25/100.

Of course we did not expect that this amelioration could be permanent. The affection was neurofibromatosis of the optic nerve, and the feeble visual acuity was due to the compression of the nerve in the canal, more especially to the neurofibromatosis, which could not be cured.

In October, 1923, the visual acuity was 2/10, the visual field tolerably good (Fig. 8). Since that time the visual power has been gradually diminishing, but it is still better than it was before the operation. The changes in the visual field are shown still better in figures 9-11, taken with the Bjerrum screen. Figure 9 shows the field before the operation with an object of 1 centimeter.

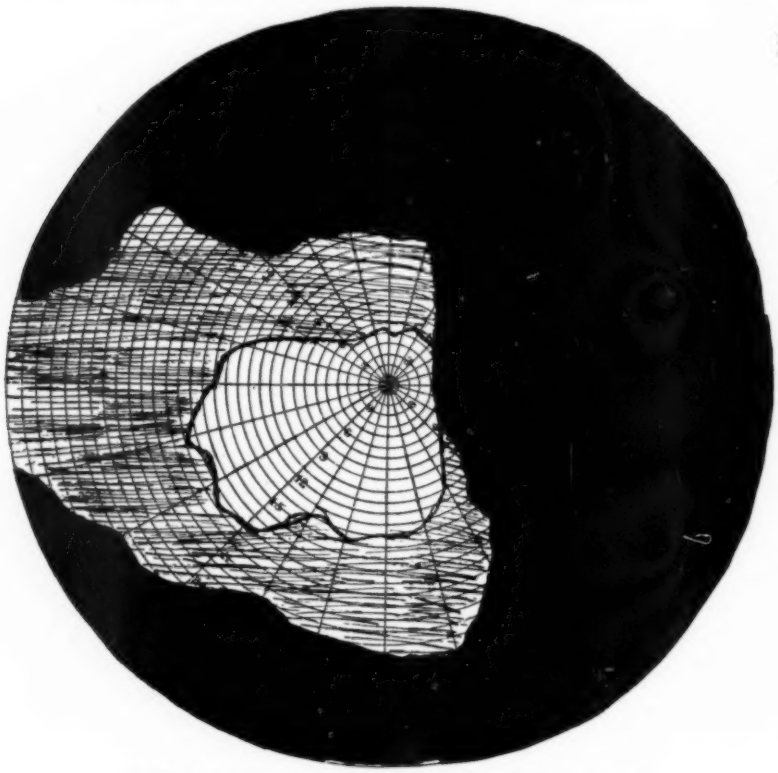

Fig. 11. Case 1. Visual field of left eye October 2, 1923.

Figure 10 the same 12 days and Fig. 11, four and a half months after the operation.

This case as well as the 7th case of Martin and Cushing belongs to the group of neurofibromatosis and could enter in the theory of Emmanuel. It is highly probable that in cases of Recklinghausen's disease, tumors of the optic nerve are much more frequent than we think; and it will be necessary to examine the optic foramen with the X-ray in every case of optic nerve affection in Recklinghausen's disease, altho we may find the enlargement only in a small number of cases.

In autopsies of patients with multiple

neurofibromatosis the optic nerve is probably not always examined, but if we do this as a routine we may find more tumors. O. Steuer[15] reports two cases of Recklinghausen's disease, in one of which there was found at the autopsy, a pea size tumor at the right optic nerve; and in the other case a tumor the size of a hen's egg at the base of the skull, reaching to the optic chiasm.

The right eye could still be closed, but with difficulty. With the finger we could feel a hard tumor in the orbit, above as well as below the eyeball. The vessels in the background of the eye were slightly hyperemic, the disc normal, the surroundings of the disc a little pale. Examination of the body and of the blood did not reveal any abnormality.

Under general anesthesia I operated

Fig. 12. Fig. 13.

Fig. 12. Endothelioma of optic nerve sheath. Front of tumor above, rear below.
Fig. 13. View of tumor from rear.

ENDOTHELIOMA OF THE OPTIC NERVE SHEATH.

CASE 2. In opposition to the former case we will describe a case of endothelioma, in which the tumor did not grow out into the optic canal.

The patient, a woman of 39 years of age, was suffering, when we first saw her November 26th, 1918, from epiphora of the right eye. We found V. L. almost 6/6, emmetropia, fundus normal; V. R. = 3/6 with hyperopia 5. D. The right eye showed exophthalmos, with Hertel's exophthalmometer, left eye, 17 mm., right eye 27 mm. The movements of the right eye are much more restricted to the temporal side.

according to Rollet's method. The tumor reached from the posterior pole of the eyeball to the optic foramen. It was impossible to separate the new growth from the optic nerve, and I was obliged to cut the optic nerve at the eyeball and at the optic foramen, when the tumor could be easily enucleated.

The eyeball was atrophic. The tumor was 35 mm. long, 30 mm. high, and 30 mm. wide (figures 12, 13 and 14). It was so closely connected with the optic nerve that they could not be separated. The optic nerve is imbedded in the tumor, as we see in the figures, especially on the section surface in Fig. 14.

The new growth had its largest sur-

Fig. 14 Fig. 15

Fig. 14. Tumor showing entrance of optic nerve in front and passage at section removed.
Fig. 15. Section showing situation of optic nerve in tumor.

face towards the optic foramen. It is a remarkable fact, that so large a tumor had so little influence on the function and the background of the eye. Histologically the tumor was an endothelioma of the optic nerve sheath.

The optic nerve (Fig. 15) lies surrounded by a wide intravaginal space in the tumor. The new growth reached at the nasal side the orbital wall, extending up along this wall to the roof of the orbit, to come down again to the temporal wall. At the lower side of the tumor we find some normal orbital tissue.

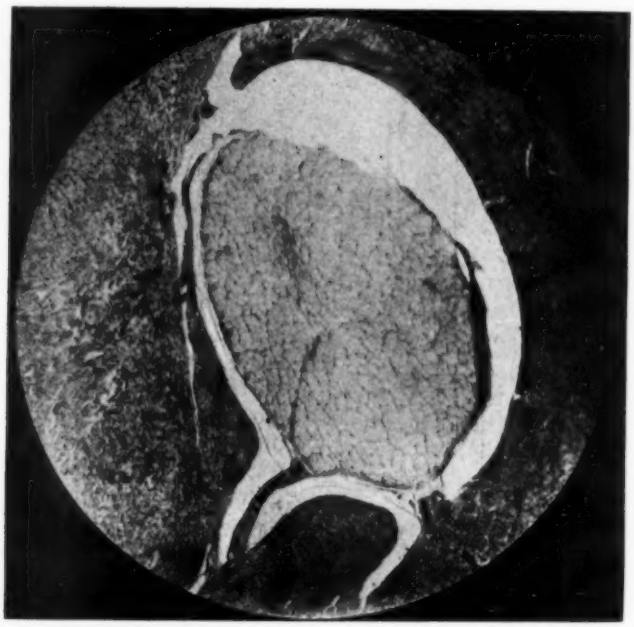

Fig. 16. Section thru tumor and optic nerve the latter in the center with extensions downward connecting with tumor.

In the photomicrographs (Figs. 16, 17, 18), we see that a thin layer of the tumor lies close to the periphery of the optic nerve (Figs. 16-18), and that the tumor mass is connected with the periphery of the optic nerve by thinner and thicker filaments, which are built of tumor cells and which cross the intravaginal space (Figs. 17 and 18).

It is highly probable that these connections grow out along the filaments, which normally connect the dura with the soft nerve sheaths. At different parts of the tumor we see how the cells of the endothelioma grow out in fibrils, as demonstrated by Siegenbach van Heukelorn, that in the liver, under certain conditions, endothelial cells of the capillaries can form fibrils.

Six years later the patient was quite healthy and had no symptoms of brain tumor, or of recurrence of the orbital new growth. A roentgenogram of the optic foramen showed this to be of normal size.

These two cases demonstrate that roentgenography of the optic foramen can give valuable information about the extension of optic nerve tumors.

Martin and Cushing have tried to get an idea about the size of the optic foramen by photographs, but I do not believe that these bitemporal photographs can give us a very good conception of the optic foramen.

RADIOGRAPHY OF THE OPTIC FORAMEN.

X-ray photographs of the optic foramen may be used: (a) To see whether fractures, fissures or callus conditions are present in the bony surroundings of the foramen and whether abnormal shadows give indication of the presence of tumors. (b) For the examination of the size and form of the foramen, to see whether the foramen is too small, too large or deformed.

Therefore it is absolutely necessary that we know exactly the condition of the normal optic foramen in the X-ray photograph. We can study this on roentgenphotographs of skeleton skulls, which show us the anatomic relations of the bony walls of the foramen and by the study of roentgenphotos of the optic foramen in normal persons.

For this purpose we can use the material which we get when we photograph the ethmoid, according to Rhese's method, which gives us a good image of the optic foramen.

As I emphasized before we must never leave the study of the radiograms to the roentgenologist alone; but must study them ourselves and consult with the roentgenologist. So in cases of retrobulbar neuritis the ophthalmologist and roentgenologist should study the X-ray photographs together, when necessary, and use their experience in judging the size and form of the optic foramen. Of course it is necessary that in judging the size of the foramen the photographs are all taken under exactly the same conditions, the same positions of the patient and the same distance of the tube from the photographic plate. Under these conditions the roentgenologist and the ophthalmologist can work out for themselves what is the size and the form of the normal foramen on X-ray photographs.

Comparison of measures of diameters found by different roentgenologist is only allowed if the photos are taken in exactly the same conditions.

According to my experience the variations in the normal optic foramen are not very great: they vary within narrow physiologic limits. White[18] gives a very interesting article on the radiography of the optic canal, using a method which is only a slight modification of Rhese's original method.

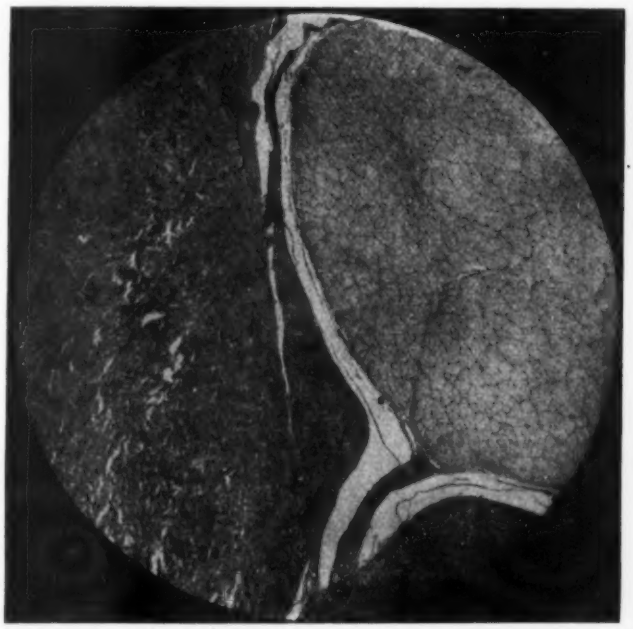

Fig. 17. Section more enlarged, optic nerve to right above, tumor left and below.

In an anatomic study the optic canals were found to vary in diameter from 4 to 6.5 mm. and in shape from the usually circular to various degrees of ovalness. White found, in radiographs, the size to vary from 3.5 to 6.5 mm.; the average diameter being 5.5 mm. Goalwin found the canal not strictly circular but that the quadrants average 4.26 to 4.5 mm. diameter.

Even in Roentgen photographs taken under the best conditions we must be very careful in our judgment; and, if we think we find an aberration in size or form, we must confirm this by making several radiograms. We see in the fol-

lowing case how easily mistakes can be made.

In 1921 a man was referred to us with slight microphthalmus of both eyes, hyperopia 16 D.; and retrobulbar neuritis in both eyes, which greatly diminished his visual power. Roentgenograms for examination of the ethmoid seemed to show that the optic foramina were very small, with thick walls. Other X-ray photographs seemed to substantiate this; and the roentgenologists agreed that this was an exceedingly small foramen, and we planned to have the optic canal enlarged if the visual power continued to diminish.

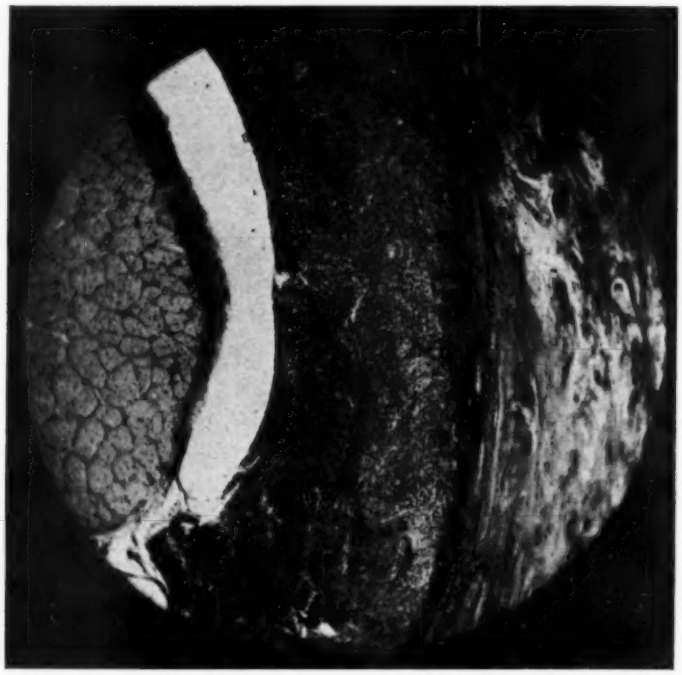

Fig. 18. Section still more enlarged showing optic nerve on left, tumor in center and orbital tissue on right.

As I did not fully trust our diagnosis, I had still another roentgenogram made. We found that the real optic foramen had normal size, but gave very indistinct images; and that the small hole which gave the impression of being the foramen, really was a part of the sphenoidal fissure, separated from this space by the shadow of a small abnormal bony protuberance. Therefore, we must be very careful in our conclusions; as small abnormalities in the bony surroundings can give rise to mistaken diagnoses.

How does roentgenography of the optic nerve canal influence our diagnosis and our therapy? An absolutely too large foramen, in suspected tumors of the optic nerve, makes it highly probable that the new growth involves the optic canal. A normal foramen, on the contrary, does not prove that a tumor of the optic nerve has not involved the optic canal, or that there can not be present intraorbital and intracranial tumors at the same time.

In neurofibromatosis, Recklinghausen tumors often are multiple, and so it is possible that intracranial and intraorbital tumors are present, without any connection with each other. It is also probable that optic nerve tumors in both parts are present, connected thru the optic canal by filaments or layers, as thin as those we saw in the case of endothelioma described above; connections so thin that they do not enlarge the canal.

Consequently, is only enlargement of the optic foramen in cases of tumors of the optic nerve of positive value? In cases of optic nerve tumor we can make X-ray photographs with some interval of time to see whether the foramen is enlarging, just as Stenvers[10] found at the inner canal in cases of tumors of the

acoustic nerve. An absolutely too small or too much deformed foramen can, in atrophy of the optic nerve, retrobulbar neuritis, optic nerve affection in tower skull, etc., be expected to give a predisposition to optic nerve disease.

In regard to the therapy we must bethink ourselves as well in cases of a too large foramen, in optic nerve tumors, as of absolutely too small foramen, as to whether it is advisable to enlarge the canal by removing the roof, or to attack the tumor and thereby restore some vision. Operation is only indicated if we have good reason to fear that otherwise total blindness will ensue.

An important part of the operation is the splitting of the dura; which, if necessary, might be prolonged till in the orbital part of the nerve. White observed in the X-ray examination of the optic nerve canal, that a retrobulbar neuritis is more dangerous in patients with narrow than in those with wide optic canals.

By examination of the 50 canals of 25 normal persons, he found an average diameter of 5.35 mm. Forty-five canals were approximately circular, whereas 5 were slightly oval. The average diameter of the canals in twenty-five cases of optic nerve involvements were 4.68 mm. and 26 of the canals were oval. According to White's observation the function of the optic nerve with retrobulbar neuritis is far more endangered in a narrow than in a wide canal, and therefore he thinks that in cases of severe optic nerve involvement we have to treat possible sources of the inflammation, as accessory sinuses, tonsils, teeth, etc., earlier if the canal is narrow than if it is wide.

One of White's conclusions is that "if the future cases substantiate the findings in those already studied, it will mean that a canal of 4 mm. or less, in a case of severe optic nerve involvement, indicates the necessity for immediate ventilation of the posterior sinuses to prevent permanent atrophy, unless some other definite focus can be found. A 4.5 mm. canal gives greater leeway for study and investigation. Optic atrophy is less to be feared. A 5 mm. canal would probably recover from almost any acute attack, either spontaneously or under local treatment."

This is, of course, of only relative value, because as there are physiologic variations in the width of the canal, there will be also in the size of the optic nerve. Consequently, a comparatively narrow canal does not make sure that the optic nerve is in more danger of being compressed than a thick nerve would be in a wide canal. However, White is right in saying that a narrow canal must be a handicap for an optic nerve in case of swelling.

White's observations are very remarkable and it will be necessary to study the size of the optic canal in every case of retrobulbar neuritis to gather material. But until we know more about the relation of optic neuritis to the size of the canal, I think we would do better to be led in our treatment by the severity of the inflammation and its consequences rather than by the size of the optic foramen, as long as this remains in the physiologic limits. When cases of optic neuritis threaten the patient with blindness and the optic canal is absolutely too narrow, we can consider the operative enlargement of the canal.

CONCLUSIONS.

Roentgenography of the optic foramen can be used not only for the examination of fissures, fractures and callus conditions, but also for the determination of size and form of the optic foramen.

We should be very cautious in our judgment of the size and form of the optic canal.

Operation by the lateral way gives a liberal view of the condition at the intracranial optic foramen, and allows us to enlarge the optic canal and to enucleate or to diminish new growths.

This operation can be used if the canal is considerably deformed or absolutely too narrow; i. e., in cases of optic nerve involvement, as tower skull, fractures, etc., and also if the foramen is enlarged by new growths, for then the canal is relatively too narrow.

The danger to life and restoration of vision should be considered. The canal operation for preservation of the visual power should be performed only if both optic nerves are endangered in such a measure that absolute blindness is to be feared.

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AN UNTIED SUTURE FOR USE IN EYE OPERATIONS, PARTICULARLY CATARACT.

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The suture here described is commonly placed in the conjunctiva. It can be tightened and the ends remain accessible outside of the lids, where they may be secured without use of a knot.

The following suture has been used in cataract operations for several months, and it is believed that vitreous loss has been prevented by the rapidity and ease with which the wound may be closed. Search of the literature has so far failed to reveal any reference to an untied suture for use in operations upon the lens. This preliminary report has been suggested in the hope that others might try it and that discussion might be raised.

The suture may be introduced before

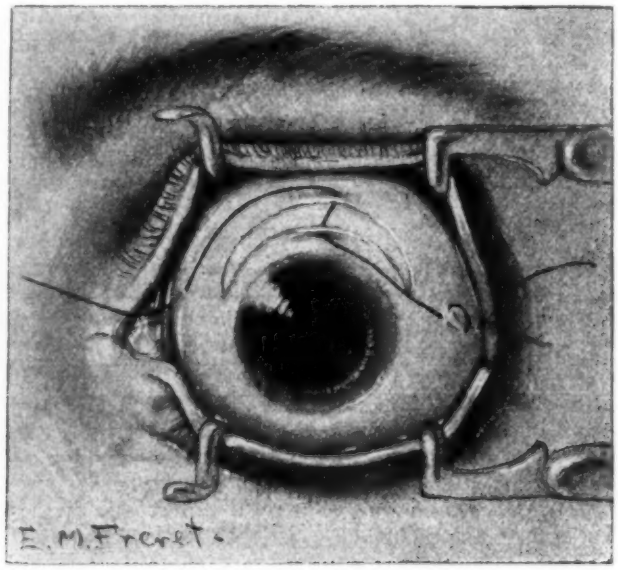

Fig. 1. Suture in position.

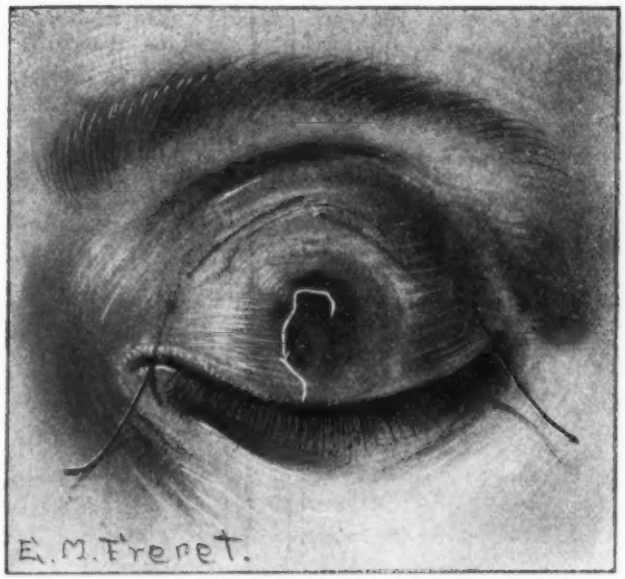

Fig. 2. Wound closed by traction on free end of suture.

or after making the corneal incision and is made with No. 3 twisted black silk impregnated with paraffin, and a conjunctival needle. A three millimeter conjunctival flap may be dissected down to the limbus of the cornea in the center of the proposed cataract section, or the conjunctiva surrounding the upper 1/4 of the cornea may be undermined thru a laterally placed button hole incision 8 mm. from the cornea. The usual cataract section may then be made, leaving a conjunctival bridge which is cut with scissors after the suture is introduced.

The suture is introduced three millimeters above the outer or inner canthus and picks up a four millimeter strip of conjunctiva.

First the upper and then the lower margin of the conjunctival opening is

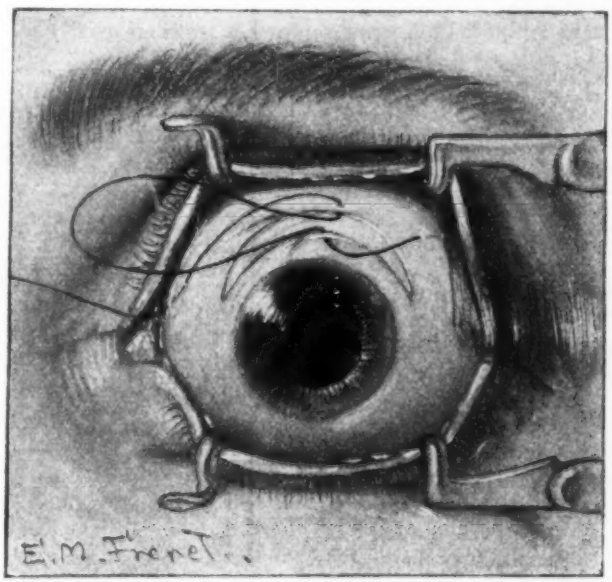

Fig. 3. Modification of method, most useful when the conjunctival flap is laterally placed.

pierced 1 mm. to the opposite side of the vertical meridian to which the suture was first introduced, or the conjunctiva is pierced above and below the point where the conjunctival incision will be made. It may be advisable to pass the suture thru the superficial layer of the cornea in some cases. The suture then embraces a three millimeter strip of the bulbar conjunctiva 3 mm. above the opposite canthus, the needle is drawn thru and repassed, making a loop, thus insuring fixation of one end of the suture. (Fig. 1). The ends are now drawn out between the eyelids and placed on the skin. The central part of the suture may be drawn to one side during the operation.

In order to close the wound it is only necessary to pull on the end of the suture, which is only passed thru the conjunctiva once and which controls the upper flap. The lips of the wound may be approximated with the eyelids closed and without further manipulation of the eyelids or eyeball (Fig. 2). If the patient is sufficiently tractable the lips of the wound may be sealed by drawing the edges together with toothed iris forceps. The suture may be passed thru the lips of the wound two or three times but it has been found satisfactory to make only one bite. Better closure of the wound has sometimes been obtained by passing the suture thru the conjunctiva above and to one side of the wound, after it has pierced the lower lip of the flap (Fig. 3). It is necessary to pass the suture in this manner when the conjunctival flap is laterally placed, if corneal irritation is to be avoided.

The same suture, with multiple passages thru the wound edges, has been found useful in large conjunctival wounds, particularly in glaucoma and muscle operations (Fig. 4). The ends of the suture should be held by collodion or adhesive strips.

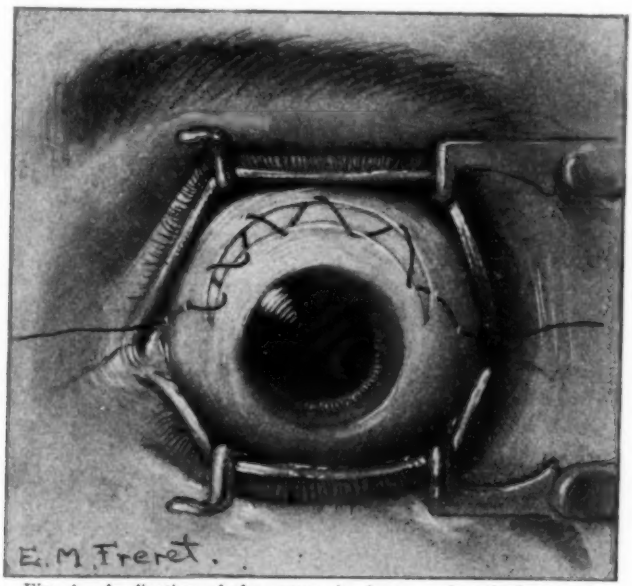

Fig. 4. Application of the suture in long conjunctival wounds.

Advantages of This Suture Over Other Sutures for Cataract or Other Intraocular Operations Where Vitreous Loss Is Feared.

(1) Ease of application.

(2) Rapidity and ease with which the wound may be closed even when the patients are squeezing.

(3) The ends of the suture are drawn out of the field of operation and are so held by the conjunctiva at the inner and outer canthi.

(4) Ease with which the suture may be removed; it is only necessary to pull one end of the suture, which is of great value in children and many adults.

(5) There is no knot and there are no loose suture ends which frequently

irritate the conjunctiva and sometimes the cornea.

(6) It has been suggested that the suture will be particularly useful in operations upon the insane and upon patients with dislocated lenses, and as a means of preventing iris prolapse after simple extraction.

I am indebted to Doctor W. B. Lancaster, Doctor John Green, Doctor F. W. Shine and Doctor W. R. Bedingfield for valuable suggestions.

SOME PRACTICAL NOTES ON SLIT LAMP APPARATUS.

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This description of the apparatus for microscopy of the living eye by slit lamp illumination includes hints as to arrangement and operation. It brings out difficulties, means of overcoming them, conditions of accuracy and results possible by such observations; altho dealing with one form of apparatus in a way that illustrates the principles involved and requirements to be met by any apparatus for the purpose.

CHOICE OF APPARATUS. These remarks apply to the apparatus made by Messrs. Zeiss, with which I am better acquainted than with that of other makers. The following list represents the minimum outfit for satisfactory work:

A table fitted with a plate glass top and with wooden pieces to fill in the cut semicircular recesses in the glass.

A nitra slit lamp. The Koeppe diaphragm tube, but not the revolving color-screen or red free filter. Vogt 10.0 cm. and 7.0 cm. achromatic focussing lens. I suggest that this lens on the rack of the slit lamp arm be called the focussing lens, and that the lenses in the body of the slit lamp be called the collecting lenses. This avoids the confusion likely to arise if the term "condensing lens" is used. The mirror, that is of the Koeppe pattern, is not required unless it is intended to work with the contact adhesion glass; it is sometimes erroneously thought that the deeper vitreous can be examined with the aid of this mirror without the aid of the contact glass. The additional vertically adjustable screw mounting for the focussing lens is not costly and is useful.

The cable feeding the lamp may, with convenience, be lengthened so that it can take a course up the pillar of the table and along the table arm to which it can be tied so that it is well out of the way.

The Microscope. These are now usually all supplied fitted with revolving micrometer drum. Paired oculars No. 2; additional oculars No. 2, matched with these, having a micrometer scale.

Paired oculars, f. 55 and A2; if economy is not rigid, objectives A3 in addition. It is a great mistake for the beginner not to learn on the low power (f. 55) and for the more advanced worker not to use it frequently. Paired oculars, No. 4, are not so often required.

If I may suggest, the compound slide base is a very unsuitable mounting for the microscope, for which it was not originally made, being designed for use with the Gullstrand ophthalmoscope. It renders certain slit lamp technic clumsy and difficult because, with its use, the hand which controls the microscope has two separate screw adjustments of the compound base, in addition to the finer screw adjustments of the microscope. The rapid transfer of the microscope across from one observed eye to the other, and the rapid adjustment of the angle of observation in relation to the angle of illumination and to the eye, are encumbered by the heavy compound base.

It is much better and less costly to have the microscope mounted on the simple tripod foot-piece which slides on a glass plate. If, however, the compound base is chosen, it is better not to have it on the bare wood table top, but on the glass plate. It will then easily slide as a whole, bodily for crude adjustment of the position of the microscope. The added thickness of the plate glass may be compensated for in the height of the slit lamp by

the insertion, under the base of the slit lamp pedestal, of a steel or aluminum plate which any metal worker can provide. Extension of the wood ledge at the edges of the table top, to prevent the microscope slipping off the table, a safeguard which is easily added.

Resistance. Even if the current is 100 volts it is better to buy the large resistance suitable for 250 volts, than the small 105 volt resistance. The cost is very little more, and the 250 volt resistance can be used on any circuit of that strength or under.

Accessories and Assembling. The room should be really dark. A mat or carpet is needed under the table if contact adhesion glasses are to be used. The table should be leveled if the floor is not level. A shaded light over the table, controlled by a switch within easy reach. The switch in the body of the slit lamp is apt to spit and fuse, if the circuit is over 105 volts: it should be kept in a permanent "on" position, and a more suitable ordinary switch interposed in the circuit, within easy reach.

For comfortable working by far the best plan is to arrange a foot pedal switch so that when the foot presses it down only the slit lamp is lighted, and when the foot is raised or removed, only the overhead lamp is lighted. Such an arrangement ensures against uncomfortable exposure of the patient, and is a great help to the observer when teaching or making notes and diagrams. A small table or fixed shelf on the wall should be within easy reach for spare objectives and other accessories. Facilities for ophthalmoscopic examination of the eye media; hence a self luminous ophthalmoscope should be at hand for every worker.

The ball bearing joint and the smaller joint of the table arm should be adjusted so that there is no stiffness and so that the arm swings with freedom. If the table is not leveled, apart from inconvenience in working, there is a possible danger: the table arm may swing by gravity (when the observer is making notes) so that the sharp end of the slit lamp arm projects in front of the head rest and these may injure the eye or face of a patient when, unawares, he suddenly leans forward to get up. The height adjusting screws of the pillars of the microscope and slit lamp should be oiled so as to work easily. If the slit lamp pillar screw is stiff, inconvenience arises from torsion on it causing the short limb of the table arm to rotate when the height of the slit lamp is being varied. The pivot joint of the slit lamp which attaches it to the top of its pillar should be loose or the screw may be turned, just enough to give a little stiffness of rotation at the joint, but the screw should not be tight. The same applies to the pivot joint on top of the microscope pillar; if this is left too loose the microscope swings too readily, and if too tight the microscope cannot be rotated by light pressure with the observer's forehead, which is the most convenient way to rotate it.

If the wooden table top is warped the glass plate should be padded as may be required beneath its edges. Any rocking of the glass plate causes difficulty in fine focussing of the microscope.

The proper adjustment of the set stop in the resistance, to yield the maximum current, is important. This may usually be set at a higher point than that in which it is sent out by the makers. The nitra lamp will stand a very brilliant illumination of its filament. The adjustment is easy; the top guard should be taken off the resistance, to gain access inside to the small stop whose small fixing screw should be loosened. The lamp jacket should be removed to expose the lamp, the current turned on and the sliding contact piece pushed along the coil until the filament is judged by inspection to be glowing to the maximum which it will tolerate, namely a vividly intense almost white glow. The screw of the set stop may now be tightened and the cover replaced. For ordinary use the lamp may be run at a little less than this by pushing the sliding contact piece back a little, but for certain purposes it is very necessary to be able to push this to the maximum possible load. As a matter of fact it is surprising what intense burning these

filaments are capable of enduring over even a long period.

In the changing of the objectives it is important not to grip them by the barrels. The three screws which support each barrel are very delicate and the least displacement, from looseness of the screws, upsets the stereoscopic effect either causing, in a sense, a hyperphoria; or, if gross, diplopia. The objectives may be held lightly just for placing them in position; they should then be pushed home into the spring grip by pressure on the end of their bevelled base. For resetting loosened objectives, it is necessary to use a micrometer eye-piece in the microscope; and, as an object for viewing, a small diagram consisting of multiple concentric circles whose center is the intersection of the limbs of a cross. If the microscope body is dropped, displacement of the prisms may give rise to diplopia, even thru correctly centered objectives.

It is generally common knowledge that the enlarged image of the lamp filament should be projected in accurate focus on the focussing lens, upon the black diaphragm of which it is visible; but those new to the work may find it easier to place a white card on this diaphragm in order to see this image more easily. When this adjustment is being made the slit should be opened sufficiently wide to create a bright image readily visible. It should be noted that the width of this projected image is just that of the aperture in the focussing lens diaphragm. If the image is not projected into accurate position a portion of the light is cut off by a side of this aperture.

Occasional inspection of the diaphragm is necessary to see that this adjustment is correct, because the effect of this error is not realized thru the microscope: it does not diminish the width of the slit beam in the observed eye, but merely dims the intensity of the illumination. It must be borne in mind that the Vogt achromatic lens, in order to be achromatic, is of very small diameter and therefore can make use of but a small section of the whole projected image of the filament; it is therefore important that the aperture in the diaphragm of this lens should be filled with as much light as is possible. The accurate projection of this image depends of course on the proper centering of the nitra lamp in its case. As far as possible this should be done by the two little base screws; then, if any further lateral adjustment of the lamp is required it may be done by the screw adjuster near the collecting lenses. Both the filament and the slit must be set so that they are vertical.

It is by no means uncommon to find workers who have used the slit lamp for a long time overlook misuse of the Koeppe diaphragm tube. It is unnecessary to take up space with diagrams explaining this simple point. Briefly, the bundle of light passing from the slit to the focussing lens increases in its diameter on its way to the lens. It is desirable, in order to avoid inconvenient additional reflexes in the observed eye, to prevent any of the light passing beyond the focussing lens save that which goes thru the aperture of its diaphragm. Light from the lower part of the diverging beam, if it strikes the top surface of the slit lamp arm at a grazing angle, shines in the eye as an additional reflex which may puzzle the observer. The observer should try this by removing the Koeppe diaphragm tube and setting the nitra lamp so that the lower edge of the beam grazes the top of the slit lamp arm. If he then looks at an eye thru the microscope (using preferably objective f. 55) he will see this reflex below the ordinary reflex due to the focussing lens and may confirm its origin by obliterating it with his finger placed on the top of the slit lamp arm. Another reflex, similarly produced when the Koeppe diaphragm tube is not used, but lying above the ordinary reflex, is due to the upper part of the beam striking and illuminating the small pillar and screw which surmount the focussing lens.

It is obviously only a matter of adjustment of the chosen position for the diaphragm tube along the slit lamp arm in order to determine exactly how much of the peripheral portion of the diverging bundle is cut off by the edges of the aperture which is

mounted at one end of this tube. The Koeppe tube should be so placed that the size of the selected portion of the projected filament-image does not exceed the outside measurement of the diaphragm plate of the focussing lens. It is obviously necessary to be more careful in the manner of this adjustment when the focussing lens is fitted in the screw height regulator which is now provided, and, it may here be added, that any nitra lamp whose filament is not straight is clearly unsuitable for use with this particular fitting. (An occasional source of flaw in a lamp may be an irregularity or air bubble in the glass at the apex thru which the rays utilized pass.)

A recess is usually provided at one end of the Koeppe diaphragm tube for a small slotted plate which acts as an accessory diaphragm; it is required for use only in certain instances with the arc slit lamp; and, unless very careful attention is paid to the position which it occupies along the slit lamp arm it may, tho often unobserved, cut off some of the rays which should pass into the focussing lens. Another source of error in the Koeppe diaphragm adjustment, which may pass unnoticed, is a slight degree of its rotation on the pivot of its clamp. The result of this is that it does not lie parallel to the slit lamp arm and that it therefore laterally cuts off some of the rays which should pass to the focussing lens. These points are really very simple in practice and only need careful attention. If the possessor of his own apparatus will only try them for himself I feel that there is no necessity to occupy space with explanatory diagrams.

MANIPULATION. The patient must be comfortable. Both patient and observer should be seated on stools adjustable in height. The patient should bring his stool close up to the table; he should not be straining forward to reach the chin and head rest; his head should be vertical, not tilting sideways, and his forehead suitably inclined. The forehead should not be unsupported but should be resting against the adjustable support provided and the eyes should be at the proper level in relation to the microscope and slit lamp. For all ordinary purposes the patient should be told to fix with his gaze the observer's forehead; the slight upward tilt of his eyes elevates his upper lid and also tends to throw the bright specular reflection from the corneal surface upwards and away from the objectives. Cut squares of tissue paper are useful as a wrap to cover the chin rest.

I work with the slit lamp nearly always on my right side, for either eye of the patient, but this may not always be practical when the shorter focus, 7 cm., lens is used, because the end of the table arm is apt to come in contact with the table corner when the slit lamp is put close up in order to focus the light across on to the opposite eye. The jointed table arm, on whichever side the observer uses it, should be arranged so that its angle joint is turned away from the observer and does not protrude against his side. I seldom change the slit lamp over to my left side.

It is convenient to put one's foot on one of the table legs (the wooden table top may be so screwed on to the table pillar that one of the tripod legs is suitably placed for this) and the knee under the long limb of the table arm; then, by flexing the ankle joint pressure may be brought by the knee under the table arm to steady it when it is in the desired position.

Two focussing systems are in use, that of the slit lamp and that of the microscope. The microscope should be set horizontal. Its focussing screw should work easily. A method of securing a very fine focussing adjustment may be resorted to, for special observations, by so arranging the foot pillar that one of its three feet is directed backwards towards the observer in line with the microscope; a slight turn of the screw of this foot piece, one way or the other, tilts the pillar and so moves the microscope slightly forwards or backwards. It is a matter merely of general principle, that at the outset, when the lamp and microscope are being adjusted to the patient's eye, both these systems should be at or near the mid point of their adjustment—the focusing of the slit lamp half way along

its traverse and the focussing rack of the microscope similarly in a mid position. The same would apply to the vertical adjustment of the focussing lens if mounted in the special screw mount. There is then ample play either way for the turning of the screws which control these adjustments. These details may sound a little labored, but it takes very little trouble for the observer to train himself to follow them automatically, and by so doing he will be repaid in quickness of work and in convenience both to himself and to his patient.

The apparatus being so adjusted and the patient ready in position, it remains only to bring the slit lamp as a whole towards the patient's eye until the beam is in sharp focus on, say, the cornea. For the convenience of the patient the slit should be narrowed considerably, and for that matter the preliminary adjustment may be made by bringing the light to a focus on the skin close to the eye, or at least on the sclera rather than on the cornea. The illumination being so adjusted, the observer for the first time, and not till now, looks thru the microscope—whose focussing has already been set halfway—and moves it as a whole on the plate glass until the illuminated region is in focus. With both elbows resting on the table top, and the slit lamp arm held by the first finger of the right hand, and the screw of the focussing lens by the thumb and second finger, while the left hand controls the microscope focussing screw, the necessary observations are made. The observer should make it a rule always to keep one hand for the focussing of the illuminating system and one for the focussing of the microscope; each is equally important. If it is desired while preliminary adjustments are being made, the finger may be placed partly over the aperture in the focusing lens; this does not distort the shape of the beam in the eye, but only dims it. Undue preliminary exposure to light is commonly a cause of unsteadiness of an apprehensive patient thruout the rest of the examination. The observer should always turn the light off the patient's eye at every opportunity, such as when pausing to make a note. This may be done by turning the slit lamp arm aside, or by turning the light off, a procedure which is especially easy if a mechanical foot switch, such as has been suggested above, has been fitted.

A few points only need be added in conclusion. Both oculars should be pushed right home in their barrels. When making critical illumination adjustments under high power magnification, the observer will find it convenient occasionally to steady the slit lamp arm by placing a finger or two of his left hand across the front of the microscope body on to the end of the arm. By resting the right elbow, instead of on the table, on the base of the slit lamp pillar, while the hand grips the adjusting screw of the focussing lens, the observer may find it convenient thus to control with the elbow the coarse movement for focussing of the illumination.

The screwed base of the lamp holder may work loose and need a twist to tighten it, otherwise the image of the filament may, unnoticed, be turned out of its vertical disposition. The lenses of the collecting system sometimes need cleaning free of grease and deposit. Dust in the slit aperture causes, when the slit is made very narrow, shadow streaks in the beam which, unlike those due to features in the observed eye obstructive to the beam, move with and do not disappear with movement of the slit lamp arm. Dust or foreign matter on one end of the slit, when this is wide, may cause disturbance of the beam image. When the small round dot apertures are used, the slit should be opened sufficiently wide to avoid lateral restriction of the diameter of the dot at its sides; except when this is especially desired, when such restriction may be useful as a means of producing a very small and very fine beam.

I have rather emphasized the importance of always having both the illumination system and the observation system under proper control. Good results in slit lamp work are dependent on attention to the illumination as precise as that given to the microscope.

COLOR SENSE OF THE SATIN BOWER BIRD.

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A sketch is given of the bower bird of Australia and the bowers it constructs, and decorations with which they are finished. The selection of colors for these decorations appear to be carefully made. Some of them closely match the plumage of the birds. They are described in the language of Mr. Nubling of Sidney and throw light on the color sense of birds.

Altho it is known by many people that certain exotic birds are in the habit of building ornamental structures of some complexity, yet the purpose and character of these erections are rarely understood. This fact is my excuse for giving a short sketch of one of the most wonderful avian families I have ever known. During my stay in Australia I had the good fortune to see, in the company of a group of ornithologists who were showing me the many attractions of the National Park, several Bower Birds and their truly remarkable "bowers." I also had the advantage of the company of the gentleman who has made a special study of these birds—Mr. E. Nubling of Sydney—to whom I am indebted for much of the information that follows. This naturalist has for several years past been noting their peculiar habits, among them their color recognitions and preferences. In addition to these observations he has, since my departure, instituted certain definite tests of their color vision, making experiments which, before long, he will, I trust be able to report in full. When completed they will form a valuable addition to our knowledge of color vision in the subclass Aves in general and of this species in particular. Meantime this short paper may be regarded as an introduction to the article which Mr. Nubling has promised to write at some future date for this JOURNAL.

It was John Gould (*Birds of Australia*, Vol. IV, 1841) who first pointed out that the bowers are constructed only by the male bird and used chiefly by him as a playhouse or resort in which he might amuse and so attract the female, who is always a passive partner in the performance. These structures vary greatly in size and complexity, from that of a "runround" of comparative simplicity, in which is placed a quantity of small bones, shells, stones, broken crockery, etc., to hedge like buildings of considerable size and intricate design, whose walls are elaborately built and whose front yard or garden is a marvel of decorative design bright with colored feathers, flowers (replaced by fresh blooms when the previous supply fades) and other esthetic objects carefully collected from the neighborhood of the bower. It is the purpose of this paper to show that this decorative material is not gathered haphazard by the bird but is the result of thoughtful selection.

The Satin Bower Bird (*Ptilonorynchus violaceus*) is about the size of our Meadow Lark. The male has a shining coat of dark blue feathers that resembles satin, especially in the bright sunshine. The irides are light blue with a red zone. The female is not so satiny blue; there is more gray-green and brown in her plumage but the eyes are more decidedly blue than those of her mate.

Of the numerous descriptions given of the house-and-garden constructions of the Satin Bower Bird, none is, so far as my own observations and information go, more faithful than that furnished by Frederic Houssay (*The Industries of Animals*, p. 80, 1893). This writer believes that the art displayed "in this bird's construction is not less interesting than the sociability he gives evidence of, and his desire to have for his hours of leisure a shelter adorned to his taste. The bowers which he constructs, and which present on a small scale the appearance of the arbours in our old gardens, are places for reunion and for warbling and courtship, in which the birds stay during the time when no anxiety leads them to disperse. They are not nests built for the rearing of their young, these being placed elsewhere." As a foundation for the bower a slightly convex floor is laid, made of interlaced

sticks, intended to keep the place dry and sheltered from the moist soil. The walls of the bower are built of reeds, sticks or grass stems in two rooms facing each other, curved towards one another at the upper extremities so as to form a sort of vault. Mr. Nubling tells me he has seen the birds grasp the building material between their mandibles and push or work the ends into the earth, and so well is the task performed that the uprights not only withstand wind and ordinary wear, but they are extracted only by a hard pull. All the sharp or irregular prominences in the building material are turned to the outside, so that the interior of the room may be smooth and offer no hindrance to the birds as they run back and forth thru it. The walls raised, the small architect now begins the labor of decoration and seeks the various colored objects just mentioned—shells, mosses, feathers, shiny stones from the brook, etc. Of these the prettiest treasures are affixed to the walls of the small house. When a Bower Bird builds a recreation and courting resort in the vicinity of human habitations, he also draws upon them for decorative material, such as colored paper, bits of colored cloth, fragments of glass, broken dishes, etc., and does not hesitate to imitate the members of the Crow family in borrowing any shiny or colored object that takes his fancy.

Mr. Nubling tells me of one bower in whose walls alone there were, by actual count, more than 400 twigs. This particular bower had, as part of its decoration, no less than 45 greenish-yellow flowers of *Billardiera scandens*.

Nubling's preliminary experiments made with colored disks—using a large number of shades, placed near bowers under construction, and reinforced by numerous other observations, I shall now report in his own words: "To return to the use of disks in the spectral colors. Without prejudice, my experience so far has been as follows:

1. *Violet, indigo, blue*: *Any* of these colors is collected by the birds, as well as any hue or tint thereof, *without any discrimination*, extending to ordinary bottle glass with just an indication of bluishness. On the other hand, I have seen pinkish-purple tinfoil chosen which by its suggestion of red somewhat surprised me. Of flowers in the three colors, or their derivatives, I have counted up to 20 species. Away from habitations, or camps, these, together with blueberries, and blue feathers of the crimson parrot, would practically be the only objects in these colors.

2. All the other colors collected correspond to those of the plumage, bill, legs, etc., of the immature male and the female, whose plumage is identical. On this I am almost positive, and many comparisons made, using Ridway's Color Standards for the purpose, have borne out my contention, which was formed already when I wrote my pamphlet.

(a) *Green*: *No pure* green is ever used; ordinary green leaves placed on the bower platform are invariably rejected. Leaves principally collected are of *Banksia serrata* (very occasionally, a similar species), then *Schizomeria ovata* (a brush tree), and occasionally a Mistleto species (faded leaves).

Banksias, corresponded to Ridgway pl. XXX, light yellowish olive; Ridgway pl. XL, dark olive buff; Ridgway pl. XL, avellaneous; Ridgway pl. XLI, grape green (or between this and light grape green), the *variations depending* on the leaves being more or less *faded.*

Schizomeria ovata Ridgway pl. XXX, olive yellow; Ridgway pl. XLI, grape green; Ridgway pl. XVI, yellowish citrine; Ridgway pl. IV, pyrite yellow.

It will be seen from the above that all the leaves of both species come under practically the *same range,* i. e. are rather greenish-yellows, while others not shown above, *fresher* in hue, may be classed as greyish-greens.

(b) *Yellow*: No true yellow is used, altho I found masses of yellow pea-flowers growing in close neighborhood to bowers. Preferred are all sorts of greenish-yellows, creamy yellows (with perhaps a touch of green), and creams, e. g., rock lilies (orchids). The principal flower is *Billardiera scandens* which blossoms most of the year. In Ridgway's color standards this corresponds to light yellow-green on plate VI.

(c) *Orange*: Never observed.

(d) *Red*: plainly disliked, and rejected at once when placed on platform.

3. *White, grey, black.*

(a) *White*: Only noted together with blue; i. e. blue and white china, blue and white paper. It is obvious that the blue formed the attraction. Where a number of pieces of blue and white china were found on a platform, occasionally a white piece without blue was amongst them; but this appears to me rather accidental. Pure white flowers or white paper I have never found.

(b) *Black*: Alone I have not (until recently) found; only in combination, e. g. in Crimson Parrot feathers, which generally show both colors.

(c) *Grey*: Not used except in string or cord.

4. Other colors: *Golden brown*, corresponding to the Bower Bird's wing and tail feathers. Objects: Snail shells, larval cases, snake skin, feathers, etc. I have just compared a wing feather of the female Satinbird with a snail shell from one bower, and the two blended perfectly.

Of course, the above record might be augmented by numerous other examples but for the present, what I brought forward may be sufficient to enable you to form some idea about the colors they prefer, and I repeat they *all* show a reference to the plumage, etc., colors.

In a recent book by H. Knight Horsfield, *Side Lights on Birds*, I found the statement that Satinbirds collect their decorations "without much discrimination." I find that their discrimination, from a color point of view, is rather wonderful."

Since making most of the foregoing observations Mr. Nubling writes me further:—"I found that one of the less accessible bowers, situated on a ledge of a hillside sloping down to a creek, had the whole of the *inside* of its walls *painted black* so completely that no free, unpainted space showed anywhere. The length of the walls, where the component sticks are closely placed, is about 10 inches, and the height about 8 inches.

"It will thus be readily seen what a task it must have been to apply the 'paint' to at least 80 sq. in. of surface when the only tool employed was the bird's beak. I had before this seen birds applying what I thought to be some vegetable matter to the inner sticks of the bower walls, but only a few inches along the base were covered, and I surmised that the object of this operation was to glue the sticks together, which, indeed, I found to be the case in several instances. The substance which the birds seemed to pick off the ground, was usually brown in color (in one instance, green) is an oily looking, viscid, opaque liquid, probably a product of decay, but I have so far been unable to identify it further. It dries rather quickly, when the dark brownish color changes to black. In that state if touched by the finger it leaves a sooty mark. On the inner sticks of a bower seen by me on Palm Creek the paint was put on so thickly that it formed a crust a quarter of an inch thick. In still another bower, situated in a grove which made the interior difficult to see and where a dark wall-painting might pass unnoticed, I found the inner walls also stained black, altho not to the extent seen in the Palm Creek bower.

"In other bowers, more readily observed, there was either no trace of painting or the stain had been applied to an isolated stick or two, and then only to a few inches of it. Evidently the pigment is not obtainable in some localities, while it is plentiful in others. To complicate matters the rain washes off the paint unless it is fully protected.

"Until I have had further opportunities to study this application of stains by the Bower Birds I shall not speculate upon the meaning of this remarkable phenomenon. Knowing these birds I am sure the purpose is an intelligent one."

THE LOCAL TREATMENT OF CORNEAL DISEASES.

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Standard methods are discussed from the viewpoint of personal experience. The following are taken up in succession; Local anesthetics, mydriatics, miotics, dionin, germicides, caustics, thermotherapy, and operations. This is the substance of a lecture given in the Section on Graduate Instruction of the American Academy of Ophthalmology and Oto-Laryngology, October, 1923.

These remarks are confined to standard therapeutic measures in the local treatment of corneal diseases; and it is my purpose to give my personal observations purely as a clinician, with the experiences and researches of others better qualified.

Some points in the compounding and preparation of the prescription seem to be worthy of a few words. I have always found it advisable and to the interest of the patient that one of several reliable druggists regularly fill my prescriptions. In doing so the prescription is not only accurately filled, but the druggist takes a pride in dispensing his orders in clean bottles that have been properly washed and boiled and in cleansing the rubber end of the medicine dropper. Any of the several types of "dropper bottles," is the best way to keep the dropper and contents clean. Other than using distilled and sterile water in the preparation of solutions for ophthalmic use, I see no reason to strictly observe sterile precautions, except of course for operative work. For the reason of economy and to ensure freshness, prescriptions should be written for small amounts. An appropriate amount of boric acid is commonly added to aqueous eye collyria to prevent fungus contamination.

Drugs for ocular purposes are usually dispensed in aqueous or oily solutions and ointments, and I think it is chiefly a matter of individual preference as to which is the more effective. I prefer the aqueous solutions on account of the ease of application by patients or attendants. I can well understand where the ointment of atropin or dionin would be preferable to the solution in a corneal disease with excessive lacrimation, or where the slow absorption of a drug would be advisable.

As to the choice of the base of an ointment, vaseline has always been my preference, for the lanolin or lard frequently becomes rancid. The most effective way to dispense a small quantity of ointment for ophthalmic use is in small collapsible soft metal tubes.

It may not be too elementary to emphasize again that in the compounding of an ointment the crystals of the drug employed should be thoroly pulverized, and then well worked into the base. And in the case of the yellow oxide of mercury, one or two drops of castor oil first added to the powder in the mortar, prevents the formation of grit like particles, sometimes found in poorly prepared ointments, which in reality act as foreign bodies to the eye.

LOCAL ANESTHETICS are indicated in painful corneal affections, such as abrasions, herpetic or other superficial ulcers, and holocain especially, and probably butyn are the two most effective. The epithelium is not impaired by their use, and holocain is said to have a stimulating effect upon the epithelial repair. When a solution of holocain is to be sterilized, it should be remembered that it should only be boiled in porcelain containers; for in glass the solution becomes turbid, due to the separation of the free base by alkali derived from glass. Duane recommends that holocain be used in an ointment or oily solution, and he further suggests that a one per cent solution of acoin in castor oil will relieve for many hours pain produced by erosion or abrasion of the corneal epithelium. The injurious effect of cocain upon the corneal epithelium is commonly known. Would it not be advantageous to employ a substitute anesthetic at all times, which will not impair that important structure?

MYDRIATICS. Drugs which have a lasting and combined power of producing

mydriasis and cycloplegia are useful in the treatment of corneal inflammations, as they forestall a complication in the iris and put the eye at rest. Atropin almost by common assent is the sheet anchor in such corneal affections, in preference to substitutes. Besides, atropin has an anesthetic effect upon the cornea and globe. This has been definitely proven to my satisfaction in a muscle operation, where thru error it was used as the local anesthetic in place of cocain.

Bertha and Herbert Haessler have shown, by their experimental work on tuberculosis of the cornea, making their observations with the slit lamp and the corneal microscope, that the first change noted in the cornea of white rabbits after inoculation, was a faint injection of the conjunctival vessels of the limbus, with an acceleration of the circulation.

Where a virulent culture was employed, there was observed an injection of the smaller vessels of the iris, which preceeded or accompanied the hyperemia at the limbus. Applying this knowledge to clinical ophthalmology it is reasonable to suppose that an iris engorgement is an early complication in corneal infections which, if true, confirms the usefulness of cycloplegics.

We have been told that to increase the effects of atropin upon the iris, it can be combined with cocain, so that contraction of the dilator of the pupil is added to the paralysis of the sphincter. To accomplish this procedure effectively, the eye is cocainized as for an operation, and then a crystal of atropin sulphat is placed in the conjunctival sac. One frequently finds that the pupil will not dilate to atropin in the dense opacities of interstitial keratitis. If a few drops of an atropin solution are injected subconjunctivally near the limbus, mydriasis is frequently produced. The employment of this method or the use of the crystals in the conjunctival sac renders more likely a toxic action of the drug and should not be used in children, who are susceptible. A dionin solution used immediately preceding and a short while following the atropin, offers a safe and probably as an effective way of increasing its effect upon the iris. Lippincott's recent observations and experiments upon the absorption of drugs by the cornea, present an entirely new idea; for the hypothesis which he offers is that the corneal nerves exert an inhibitory influence on absorption, and the latter is favored by paralyzing the nerves. He used a nonmydriatic anesthetic in one eye, preceding a mydriatic in both eyes, and found that the pupil dilated more promptly and completely in the anesthetized eye. The article, appearing in the August number (Vol. 6 p. 631) of the AMERICAN JOURNAL OF OPHTHALMOLOGY, should be carefully studied, to appreciate this simple but important discovery.

Atropin is used for a specific indication, namely to dilate the pupil. When this has been satisfactorily accomplished it seems unwise to indiscriminately continue it three or four times daily, thus rendering the patient liable to the unpleasant symptoms and complications which might follow. Particularly is this true if the drug is to be used over a long period, when it may produce an enlargement of the lymph follicles of the conjunctiva. A solution contaminated by a mould fungus, and not the alkaloid, is thought by many to be the direct cause of this conjunctival irritation. Likewise the indiscriminate use of 4% solution or the crystals of atropin, other than in clinics and hospitals by the surgeon, should be avoided. One occasionally hears of a patient who has a susceptibility or idiosyncrasy for atropin; personally I have seen but one. As a substitute a weak solution of scopolamin (which drug is more toxic than atropin) may be employed.

While atropin is commonly used in deep corneal affections, it is a disputed point by some if it is useful in superficial lesions, when miotics are thought to give better results. I have never shared in this latter view, and my plan is that when there is continued pain with an accompanying miosis in a superficial corneal lesion, I employ atropin sufficiently to dilate, for I believe much of the discomfort is due

to the spasm of the iris sphincter. Morax has reported an interesting case of a painful corneal ulcer with miosis, which did not respond to treatment until an iridectomy was performed. I think I see an analogy between this "Sphincteralgic Ulcer," as it was classified, and my contention.

MIOTICS. Aside from what has just been said, miotics (eserin and pilocarpin) are only employed in corneal affections when the perforation of a marginal ulcer is imminent. In my hands this seldom has the effect of preventing an iris hernia or prolapse. Usually in such cases miotics are used too late to overcome the action of atropin, but a distant corneal paracentesis will hasten the effect of the miotic.

DIONIN is one of the few modern drugs which has stood the test of time, and its action is almost certain. Primarily I regard the action of dionin as a lymphagogue, evidenced by the chemosis produced by the instillation of a 5% solution. Darier, its most ardent advocate, and who by the way accidentally discovered its action, claims that the dilatation of the lymphatics or blood vessels causes the natural protective substances of the blood to pass into the tissues of the conjunctiva and cornea, and even intraocularly. Its analgesic effect is well known, and the relief of pain in most corneal affections is prompt and complete.

On account of the intense chemosis and swelling of the lids, which often accompany the first instillation of a 5% solution, it is advisable to explain its action to the patient, thus avoiding the fright which might follow and which might make him cease treatment, or seek other advice. It is claimed that the greater the chemosis the more effective is the drug's action, and that when it ceases, it should be discontinued. I do not altogether share this opinion, but would modify it by suggesting that when a strong solution ceases to smart or produce a decided hyperemia of the eye then it should be withdrawn, but resumed after a few days. Very strong solutions, or the powder, should be applied by the surgeon and rarely more than once a day. Fuchs does not subscribe to all that is claimed for dionin and regards it as a local irritant, very much as the ointment of yellow oxide of mercury.

As for its therapeutic effect in corneal diseases, I do not employ it in the height of acute conditions, except in ulcerations. In the first stages of interstitial keratitis, it flushes the lymph spaces and prepares the eye for the stage of hyperemia which usually follows. Then it is discontinued until the termination of its course, when it is again resumed. In the noncongested type of interstitial keratitis, a strong solution, or the powder, may be applied daily with happy results. In the resolution of inflammatory corneal opacities, dionin used on alternate weeks with the ointment of yellow oxide of mercury, seems to favor absorption. In the dense opacities we are only deceiving ourselves by its continued use.

GERMICIDES. Local treatment with germicides, that is the instillation of drops or the introduction of ointments into the conjunctival sac, is only of value to combat corneal infections when the bacteria are situated in the most superficial layers of the cornea. Scrapings from ulcerated areas, for smears and cultures, should be made to determine if possible the offending organism, for upon that knowledge previously gained largely depends the type of medication used and often the success of the outcome.

The soluble *zinc salts*, as an example, have for a long time been regarded as a specific for the bacillus of Morax-Axenfeld, and in the small superficial corneal ulcers which frequently accompany a conjunctivitis of this infection, the sulphat of zinc, in strength of about one grain to the ounce, is effective. When the ulcer does not respond to this treatment Axenfeld recommends that it should be touched with a 2% solution.

In considering pneumococcic ulcers, one naturally thinks of optochin, *ethyl hydrocuprein*. Volumes have been written as to its efficiency, Bedell citing 91 references in his ar-

ticle appearing in 1920. Reliable observers have recorded rapid cures of corneal ulcers from the use of a 1% solution, instilled every two hours during active treatment, with daily applications of a 2% solution directly to the ulcer. On the other hand we find many good clinicians whose experience with the drug has been any thing but satisfactory. Besides being regarded as a specific for the pneumococcus the drug has the property of producing prolonged anesthesia of the globe. One of the requisites for success of the use of optochin is that the solution be freshly prepared about once a week. Too long continuance produces a tolerance, which Gradle regards as a lessened action of the drug, but corrected by a fresh solution.

In as much as I rarely see a pneumococcus infection of the cornea, notwithstanding a clinical experience where dacryocystitis is common, I have no very decided view as to the usefulness of optochin.

Of the preparations of *iodin*, the official tincture of 7% is the form most commonly and effectively used in the treatment of corneal ulcers. While it is highly germicidal to bacteria immersed in it, I agree with those who are not its advocates, that it does not penetrate the tissues effectively; and I employ it in superficial ulcerations only, as in simple traumatic and dendritic ulcers. I do not regard its action as a caustic, in the sense that we use phenol, and for that reason I have classified this most efficient medicament under bactericidal agents. In using it I employ first an anesthetic which does not destroy the epithelium of the cornea. The ulcer and the surrounding cornea are well dried which prevents the alcohol from becoming diluted with tears and flowing over the cornea. A toothpick tipped with a tiny wisp of cotton and rolled to a point, saturated with the solution and fairly dried, is an efficient way of touching the ulcer until it well becomes brown.

In regard to *silver and its salts*, the nitrate of silver, argyrol and protargol are the best known. Other than in corneal infections complicating a conjunctivitis, I have seen but little effect from their use. I have thought that the application of a concentrated solution of nitrat of silver to the ulcer was contraindicated, on account of the possibility of the formation of the oxide on exposure to light, which would produce an additional opacity to an otherwise cleared area. I am sure that I have seen this diffuse opacity in infants corneae, following a Neisser infection where a 2% solution of nitrat of silver had been instilled into the conjunctival sac. Argyrol used in the treatment of corneal ulcers, is not without danger, as it may cause a permanent brown stain at the seat of the ulcer (de Schweinitz).

Anilin dyes have an indifferent germicidal action upon bacteria altho they are still frequently used in corneal ulcerations. Verhoeff found that staphylococcus aureus was not destroyed in a saturated solution of methylen blue, or in weaker solutions of gentian violet and fuchsin. At best they are feebly antiseptic, except in the most superficial infection; and of value only in staining the ulcer for cauterization.

Caustics. When the corneal infection has passed into or destroyed the deeper layers, the bacteria can only be annihilated if the tissue is also destroyed as by cauterization. This is accomplished by caustics, which should be applied with precision to the affected spot, so that every vestige of healthy cornea be preserved. Therefore in the use of liquid caustics, the most commonly used, the greatest care should be exercised in protecting the clear cornea. Lightly tipped cotton applicators, or better still the end of tooth picks dipped into the liquid and then dried, are the most effective ways of making these applications.

Various chemical agents have been recommended; such as nitric acid, phenol, trichloracetic acid (Gifford), formalin (10%) (Weeks), and concentrated Lugol's solutions (Verhoeff). Probably any of them will check the infection if properly used. The thermocautery, used extensively some years ago, is still preferred by many operators, who claim that by its use

much of the fear of serpent ulcer has disappeared.

I prefer phenol to all other chemical caustics, as it is the safest in that its action can be largely controlled by alcohol. Indeed the cauterization of an ulcer with phenol, and the immediate application of alcohol, prevents an unnecessary sloughing of tissue.

Inasmuch as chemical or thermal caustics are usually used in the treatment of hypopyon keratitis of whatever origin, the knowledge of the actual position of the bacteria in these ulcers is of importance, as this determines the extent to which radical treatment should be used. In pneumococcic ulcers, the seat of the infection is under the infiltrated margin, in contrast with the other forms of hypopyon ulcers where the organisms are found in the floor.

I believe there is as much art in properly preparing an ulcer for cauterization and the actual operation of cauterization, as in doing an iridectomy; and the success in either case depends upon the care in observing rigid technic. Thus Mac Nab in his treatment of pneumococcic ulcers, after having used cocain and fluorescein, curetted with a fine spoon or knife point the infiltrates, especially those under the overhanging epithelial edge, and then with fine scissors clipped away its projecting margin, and finally cauterized with the electrocautery.

Likewise Verhoeff's preparation, which particularly appeals to me, is briefly described as follows: The patient is placed in a reclining position, the eye well anesthetised and a speculum inserted. He is told to fix at some object on the ceiling until the ulcer is directly upward and this position is maintained thruout the treatment. Crucial incisions are made into the floor of the ulcer with a Beer's knife according to its severity, being careful not to enter the anterior chamber. With the point of the knife the infiltrated border is curetted. The entire cornea around the ulcer is now dried with small dry cotton swabs.

Verhoeff uses as his caustic a highly concentrated Lugol's solution (I 25, K. I. 50, Aq. 100). This is applied by means of cotton tipped toothpicks directly to the dried ulcer. Additional solution is added until a puddle is formed in the ulcer, which is allowed to remain five minutes, when it is flushed out with boric solution. Boric solution is used, should the patient move his eye and the caustic flow over the cornea. In progressive cases, after the foregoing treatment has been applied, a small central corneal incision is made to evacuate the aqueous, not the hypopyon, as he thinks it holds the lens and iris away from the opening and thus prevents injury to those structures. Atropin, White's ointment and a binocular bandage are then applied. The beneficial effects are noted in 48 hours. If no improvement is noted in 72 hours and the anterior chamber is reformed, the treatment is repeated.

In two cases in which I have tried it, this procedure was effective. I believe, however, that other caustics would have acted as well as the concentrated Lugol's solution, and that some of the success attending this operation was due to the small central keratotomy. Verhoeff has very recently abandoned the use of Lugol's solution as the caustic agent, and now employs the electric cautery directly to the infiltrated area, and indirectly to the entire floor of the ulcer.

In regard to *thermotherapy*, it is recognized that heat is the most certain means of provoking active hyperemia and an acceleration of the lymphatic circulation. When used about the eye, the hyperemia is carried into the deeper structures of the globe, which does not cease with the withdrawal of heat but may persist for 24 hours (Darier). The easiest way to apply moist compresses is by a large wad of cotton, dipped into a bowl of water, heated by a spirit lamp. I have never seen any especial advantage of the newer inventions and electrical appliances over this simple method. A contraindication for the employment of heat to the eye is a mycotic keratitis (Aspergillus funigatus). The raising of the temperature favors the growth of the fungus, with the spreading of the

ulcer. Incidentally the sequestrum of cornea produced by the growth can be removed with a foreign body spud or needle, and the necrotic area cauterized.

The effectiveness of the *thermocautery* in the treatment of corneal ulcers has been proven. The chief objection to the cautery, which likewise applies to caustics, is that an excessive amount of tissue is destroyed to insure destruction of the bacteria and undue scarring is the end result. Several attempts have been made to obviate this difficulty. Weekers held the tip of the galvanocautery at a short distance from the cornea to destroy bacteria by indirect heat. Shahan by careful experimental investigations has perfected an instrument which he calls the "thermophore" by means of which one can accurately control the temperature to which the cornea is heated. The earnestness of Shahan, and the remarkable success with which he and his colleagues have used the instrument in the treatment of serpent ulcer make one believe, as he states, that the thermophore is specific. In Mooren's ulcer it has no effect, which is suggestive evidence that this type of ulcer is not of bacterial origin. The thermophore and the method of applying it to the ulcers of the cornea are well known. With the latest model the application is made for one minute at a temperature of 158 degrees Fahrenheit.

Operations. A word concerning certain operations in the treatment of corneal affections. If my experience is any index of the infrequency of serpent ulcer, I believe it is less common today; due possibly to the numerous eye clinics in cities and industrial centers, the frequency of sac operations and better living conditions among the poorer class. We therefore hear less of the Guthrie-Saemisch incision, a very necessary procedure at times. The technic of this operation is too commonly known to repeat, except to say that it should be done carefully and deliberately, and in nervous patients ether should be administered. After the puncture and counterpuncture with a fine Graefe knife, a slight lateral motion made with the instrument will allow the aqueous and hypopyon to slowly escape before the section is completed. And if a slight backward pressure is made with the hilt of the knife, the iris is kept back in position. This procedure lessens anterior chamber hemorrhage and severe iris incarcerations. While the operation is commonly performed by some surgeons, I only employ it as a *dernier ressort*, that is when the ulcer has resisted all treatment and perforation is imminent.

A partial or complete *tarsorrhaphy*, as the condition might warrant, is a useful operation for the protection of the cornea in certain neuropathic disorders, and where the cornea suffers from exposure. Knapp has successfully practiced it in a case of exposure keratitis, resulting from an exophthalmos in Graves' disease. Tyrrell has sutured the lids in two cases of Mooren's ulcer with clearing of the cornea.

I have employed it with benefit in a case of hyalin degeneration of the cornea. The lids were closed for one year, with an apparent arrest of the opacities.

Conjunctivoplasty, that is the transplantation of pedunculated conjunctival flaps, is advocated in the treatment of corneal ulcers, but like many other procedures in ophthalmology it has had its wave of enthusiasm. What Knapp said in 1898, I see no reason to change now, that is "an aseptic corneal ulcer needs no conjunctival flap to cover it, and whether it is prudent to cover an infected ulcer however carefully sterilized, has to my mind, to be proven by further clinical observation." The use of conjunctival flaps in the repair of corneal wounds, fistulas, and allied conditions, has been proven to be of value, but its discussion is not within the province of this subject.

Likewise the operation of peritomy, once much in vogue for the relief of a trachomatous pannus, and other superficial corneal diseases, has now reached its level of usefulness. In some special cases, especially where the pannus is thick, the relief and the clearing of the cornea, while not always lasting, is indeed remarkable. As important as this operation, is the electrocauterization of the larger episcleral vessels.

In closing it may not be amiss to call attention to the usefulness of two mis-

cellaneous procedures in the treatment of corneal diseases. One cannot too strongly advocate the use of the bandage or a snug pad to the eye, in the treatment of abrasions or erosions, superficial and noninfected ulcers; for besides lessening the discomfort to the eye, it promotes rapid healing.

The time honored custom of dusting calomel on the cornea in phlyctenular keratitis, or torpid ulcers, has lost none of its effectiveness because it is an old remedy. Used as an irritant to the cornea to promote tissue repair, as well as for its antiseptic qualities, in many cases it is most effective when other things fail.

To scan the literature of ophthalmology, as I have done in the preparation of this lecture, one is impressed with the storm of enthusiasm which heralds some new drug or mode of treatment, and which in time usually dies down to a gentle breeze and passes on, occasionally leaving behind something worth while.

This emphasizes how largely empirical are our therapeutic measures, which are often based upon no scientific investigation or principle and used because some one else reported a cure. A famous surgeon once well said that, "We cannot reach a satisfactory conclusion on any subject until its boom has subsided," and perhaps after all, this "survival" is the best test of worth. To adopt a too conservative policy, would hinder progress, but in our enthusiasm we should not forget older methods which like old friends, are tried, trusted and true.

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CONTRIBUTIONS OF THE SLIT LAMP TO OUR KNOWLEDGE OF ANATOMY, DIAGNOSIS, PATHOLOGY AND PROGNOSIS OF OCULAR DISEASE.

ROBERT VON DER HEYDT, M.D.

CHICAGO, ILLINOIS.

This survey of microscopy of the living eye brings together its most important contributions to conditions found in the conjunctiva, cornea, anterior chamber and crystalline lens. Read before the Sioux Valley Eye and Ear Academy, Omaha, Nebraska, June 30th, 1924.

Microscopy of the living eye has been made practical by the slit lamp of Allvar Gullstrand. This new science has proven itself a great aid to histologic research and refinement in ocular diagnosis.

I will take the liberty to quote a sentence from the introduction in the "Atlas of the Histopathology of the Eye" just written by Adalbert Fuchs. He says: "Since the advent of refined methods of microscopic study of the living eye, the interest in histopathology has risen to unprecedented heights."

The newer method of narrowing the bundle of light to about one-tenth or less of its usual width, allows of the inspection of all media by means of an extremely thin optical cross-cut sec-

tion. This method has recently opened a field of even greater refinement in the observation of histologic detail.

A few facts that may here be stated have in a way been known thru the study of stained sections of the eye. These observations have been verified and our knowledge amplified in the examination of the living eye under the magnification and intense illumination given by this new aid to ophthalmology. It would be presumptuous on my part to attempt anything beyond cataloging a brief outline of the more important facts disclosed by this most interesting and fascinating new method of observation.

ANATOMY AND PHYSIOLOGY.

In the vessels at the limbus we have been able to study the circulation of the blood in its varied aspects. I have repeatedly observed instances of stoppage and reversal in the blood current within these vessels. This evidently was due to a change in the balance between arterial and venous pressure.

Superficial lymph vessels, not in any relation to blood vessels, arranged in a radial manner at the limbus, were exposed by staining the living tissues with methylen blue by Knuesel, Vonwiller and Ascher. These lymph tubules are seen to be surrounded by pigment, in a characteristic manner, making them appear to have a dark wall.

The corneal nerve fibers plainly show their medullation and dichotomous branching. The physiologic dew like infiltration of the superficial cornea at the limbus—a saturation with nutrient fluid—is seen by transillumination. The carpet of endothelial cells on the posterior cornea is seen in the reflex. Each individual hexagonal cell is plainly outlined under a magnification of about 35.

The iris in its varied types of design, coloration and pigment distribution, as well as the phenomena of dilatation and contraction of the pupil, is before us like a beautiful animated picture. Pupillary membrane remnants are so commonly found, that they may almost be included as normal histologic findings, tho they are not.

Within the lens we are able to see and identify the various lamellar and nuclear layers, with their characteristic suture designing and surface contour. The vertical Y of the anterior and the inverted Y of the posterior embryonic nuclear surfaces are plainly visible in all normal lenses.

By virtue of incipient lens changes which naturally follow anatomic lines, the latter have been emphasized and exposed. Out of these findings a new anatomic knowledge of the lens is in course of development.

The posterior capsule, thruout life, bears evidences of the remnants of embryonic vascular activity as well as a more or less complete curved line —the demarcation of the eversion of the hyaloid canal. Many eyes show the physiologic remnants of the hyaloid artery on the nasal side of the posterior lens capsule in varied spiral form.

The supporting structure of the vitreous in its manifold aspects is before us. It resembles vertically folded portieres, or a succession of crinkled, wavy membranes, varying in design according to the play of reflected light.

DIAGNOSIS AND PATHOLOGY.

I have been able to make a very early definite diagnosis in cases of suspected, recently acquired trachoma, by finding the otherwise invisible, very incipience of pannus formation, at the upper limbus.

In cases of keratoconus we are able to make a very early diagnosis by one or more of the characteristic changes. These are thickening of the nerve fibers, a changed surface reflection of the endothelium in the back of the cone, the striping in the deep stroma, as described by Vogt, as well as the characteristic hemosiderin ring first described by Fleischer. Similar pigment lines as described by Stähli are seen in slightly altered as well as normal corneas. They are now accepted as evidences of fractures in Bowman's membrane. In many cases, which fact I have had occasion to verify, they account for the inversion of the astigmatism in age. Corneal nebulae and maculae may be studied, and the fact that they assume a circular circumscribed form as well as develop an anterior apposition of clear tissue has been determined.

Pathologic dew like infiltrations of the epithelium can be observed by transillumination, and are being interpreted in their connection with varied ocular and corneal lesions. These changes, when limited to small areas, for instance surrounding corneal scars, were heretofore unrecognized.

The derivation and contour of vessels and the fact that all deep vessels are permanent or passive carriers of blood has been determined. Wrinkling of Descemet's membrane is very common. It is an evidence of recent perforation—operative or traumatic—as well as seen in hypotonia. On the posterior corneal surface and in the anterior chamber we may make an intimate study of the flora of pigment granules, cells, leucocytes, amorphous cellular debris, mutton tallow spots, synechiae and exudative masses in various stages of deposition and absorption. The affinity of cellular deposits for the posterior surface of circumscribed corneal lesions has been observed.

The study of depigmentation—senile, postoperative, traumatic, as well as inflammatory—within the anterior chamber, has opened a new chapter in ocular research.

In iridocyclitis, exudate masses of all kinds may be studied as to their physical behavior. When impregnated with pigment cells the latter are seen to proliferate, as if fertilized by the exudate. I have seen large masses completely covered by a carpet of chocolate colored pigment over night.

In the aqueous we see normally an optically empty space. Leucocytes or similar cell elements are seen in the very incipience of uveitis, and by their presence demonstrate the normal circulation of the aqueous. They rise in the posterior zones because of the warmth of the iris and are precipitated anteriorly near the colder cornea. In cases of choroiditis their presence denotes recent involvement or an inflammatory relapse of latent or old lesions. Pigment cells in this medium as well as erythrocytes in hyphemia may also be observed and differentiated.

The iris shows a varied pathology. Cyst formation, inflammatory as well as inclusion cysts following perforation, may be studied. The perforation may be discernible only by finding the often minute corneal scar. In instances of a questionable history of trauma this finding will clear up the diagnosis, and is of vast importance. Hyperemia of the iris, depigmentation in its varied aspects, atrophy, pupillary rigidity and the varied types of eversion and atrophy of the pigment layer are before us and may be easily observed and interpreted.

In examining the lens the various types of cataract may now be better interpreted as to their etiology and period of genesis. Nuclear sclerosis, the socalled senile cataract, diabetic cataract, coronary, lamellar, cataracta complicata, as well as a host of other more rare types of lens clouding, are being properly classified.

The vitreous shows infiltration by blood cells, pigment, leucocytes and cholesterin crystals. Incipient uveal pathology may be diagnosed by evidences of fluidity of an otherwise clear vitreous, as well as by the very beginning of cataracta complicata under the posterior capsule. These early changes are not visible by other methods of observation.

PROGNOSIS.

Our ability to prognosticate an advance or retrogression in pathologic conditions has been amplified by many observations which can only be made with the microscope under slit lamp illumination.

In iridocyclitis a progression or retrogression of the process may be interpreted by the behavior of the leucocytes or cell bodies in the aqueous. A retardation of motility and the development of rigidity speak for added exudation. A reversion to greater fluidity denotes improvement.

In socalled senile cataract a relative quiescence or the tendency to a rapid further progression may be diagnosed. In the cases where the incipience or spoke formation may be diagnosed by the presence of fissures filled with fluid or lamellar separation is seen, a progression is iminent. These water fissures are invisible by focal light or with the ophthalmoscope. They are best seen by utilizing the extreme nar-

row beam. If they are not found, a quiescence may be prognosticated.

The development of a subcapsular vacuolar layer in advanced cataract speaks for an easy operation. I have often been able to verify the observation that this fluid, subcapsular layer facilitates a complete expression of the cortical material. In the cases where I have found this layer of vacuoles I have unhesitatingly done an expression, without making an iridectomy.

All of these very interesting findings are of great value to ophthalmic practice. But little added time is necessary in practicing this new method. With it one incidentally learns the art of accurate observation.

INCIPIENT CATARACT.

GORDON F. HARKNESS, M. S., M. D., F. A. C. S.

DAVENPORT, IOWA.

Special nonoperative methods of treating partial cataract have often been suggested but the results are disappointing. This paper reviews some recent literature of the subject, brings together the experience of the writer in sixteen cases and the conclusions of forty teachers of ophthalmology in American Class A Medical Colleges. Read before the Iowa State Medical Society, published here by courtesy of the Iowa State Medical Journal.

The results of the nonoperative treatment of incipient cataract are purely a matter of clinical observation confirmed subjectively by the patient. If successful, it offers a great boon to the thousands so afflicted. Personally the results have been most disappointing. With a desire to satisfy myself as to whether I was prescribing needlessly and without benefit to my patients I undertook a rather careful resumé of the literature, and also gathered the opinions from the Chairs of Ophthalmology of a number of the Class A medical schools of this country. To those men who were so kind as to write me on the subject I wish to express my sincere appreciation for their most valuable letters, and for the assistance rendered by Dr. J. E. Rock, associated with me.

There are probably several factors that may be responsible for the contradictory opinions of various observers. A more careful classification of the types of cataracts treated, together with a limitation of treatment to those in the first stage of incipiency with little loss of vision, might offer a better prognosis.

The slitlamp in studying lenticular changes may prove to be a diagnostic aid, by indicating treatment before lens changes are manifest by any appreciable loss of vision, or by the ophthalmoscope.

Without entering into a scientific discussion of the pathology of senile cataract I believe we may safely consider it a degenerative process. The cortical changes are first not so much in the lens fibers themselves as a change in the interfibrillar spaces. Actual fissures occur, which are filled with fluid. Later the changes take place in the lens fibers.

Cataracts may progress rapidly to a certain point, then apparently be retarded, or enter a stationary period, and finally undergo reabsorption, all without any treatment. This important fact seems to have been overlooked by some observers, when drawing conclusions in their writings. Complete spontaneous clearing of the lenses without treatment after the formation of opacities is reported in 147 cases by 51 observers[30] (Am. Encyc. Ophthal. p. 1503.)

The changes in the lens are not inflammatory, there being no bood vessels; yet it is well known that lenses are affected by nutritional disturbances in surrounding tissues, which may be inflammatory in nature.

Lens changes have long been known to be associated with conditions affecting metabolism, improvement taking place as the general condition of the patient improves. The disappearance of lenticular striations in diabetes after the patient follows dietary rules has frequently been observed.

Since the recognition of foci of infection and systemic absorption therefrom, retardation of progress and even

improvement in lenticular changes have been noted following the removal of the infecting foci.

Our present knowledge of the nutrition of the lens is quite meager. Probably thru a modified endosmosis, its protoplasm possesses a special affinity for certain nutritive elements supplied from the ciliary body and ciliary processes. We know further that lens material is organ not species specific; and what the future will offer, aided by the biologic chemist in the way of lens antigens and so forth, we can only conjecture.

Fuchs states that while successes have been reported there has been no convincing proof that any of the remedies suggested are effective in any but a very small minority of cases. It is unfortunate, perhaps, that writers do not have the same inclination to report their failures as they do what they consider to be their successes. Hence a bibliography of this subject finds few articles dealing with the failure of any remedies.

Badal revived the use of potassium iodid and reported gratifying results which have received substantiation at the hands of other men. H. W. Woodruff (Encyl. Ophthal. p. 1450) states, that under hydriodic acid and iodonucleid treatment, he had seen no cases of incipient cataract where treatment had been followed for a long time, in which the vision had grown worse. Meyer-Steineg[6] in 1914 reported improvement in 43 cases out of 54 under iodin treatment, and in 23 the vision returned almost to normal.

H. Smith[5] in 1912 announced improvement in vision in 8 cases by the use of subconjunctival injections of cyanide of mercury.

J. H. Burleson[16] reported on 50 cases using the same treatment in which all improved temporarily, but that after three months vision failed and the cataracts progressed except in those cases where definite foci of infection had been discovered and removed.

W. J. Blackburn[10] reported good results in 85% of a series of 176 cases, using cyanide of mercury on some and prolonged potassium acetate or citrate medication together with local iodin medication.

A. S. and L. D. Green[13] reported 58% improved and 25% arrested by the use of mercury cyanide injections.

When it comes to one of the newer remedies proposed, Cohen and Levin[12] reported 87% and Franklin and Cordes[15] 84.3% improved by the use of radium.

I. L. Van Zandt[18] calls attention to the frequency of cataract after thyroidectomy and reports his own personal experience and improvement under endocrin therapy, following symptoms of endocrin imbalance.

From an interest aroused by the effect of milk injections as a general defense measure in infections and inflammations of the eye, we were led to try them in incipient cataract. Boiled milk was used in a few cases and given up due to an inability to standardize the milk obtainable. The results to be presented are of a small series of 16 cases, in which lactigen (Abbot) was used. Each patient with one exception received five injections.

Space does not permit extended comment on the many remedies suggested and successes reported with them; suffice to say that gratifying results have been reported with all of these in the following list. A multiplicity of remedies recommended for any one condition generally means that none of them measures up to the mark.

Remedies and Measures Suggested: *Local*: Massage; correction of refractive; hot applications. Eye drops: dionin, sodium iodid, potassium iodid fibrolysin, iodolysin, nascent calcium iodid. Subconjunctival injections: cyanide of mercury, bichlorid of mercury, sodium iodid, potassium iodid, sodium chlorid, dionin, sodium acetate. Radium, galvanism with iodosol or iodovasogen, tincture of cineraria maritima, resorcin ointment.

General: Turkish baths, potassium iodid, sodium iodid, mercury biniodid, iodoglidin, benzoate of Hg. intramuscularly, pilocarpin, sodium thiocyanate, alkalinization of the patient, serologic treatment, lentocalin, lens albumin, lenticular protein, high frequency current, potassium or sodium acetate or citrate, endocrin therapy, iodonucleid, hydriodic acid, autogenous vaccines.

Cases Treated by Injections of Lactogen.

Case 1. Aged 53. 12-1-23. Media clear, no vitreous opacities; sclerosis of vessels, cortical opacity, January Vision=R.17/16; L.17/16. 2-12-24, V= R.17/16; L.17/16. Has high blood pressure. Says he sees better. Test does not confirm.

Case 2. Aged 70. 12-10-23. Cortical opacities, discs seen and show some atrophy; floating opacities in L. Vision=R.17/100; L.17/200. 4-9-24. R.17/100; L.17/70. Says vision is improved.

Case 3. Aged 65. 12-1-23. Faint striations seen in lens. Vision=R.17/25 -5; L.17/25. 12-29-23. Vision=R.17/ 16-7; L.17/16-7. No change seen in lenses. Patient reports vision improved.

Case 4. Aged 59. 10-1-23. Fine cortical opacities in L. Vision=R.17/ 16—; L.17/33. 11-3-23. Vision=R.17/ 16; L.17/25. Opacities seem fainter. Patient reports improvement.

Case 5. Aged 59. 10-6-23. R. floating opacities, cortical opacities; L. Haziness of lens. Vision=R.17/100; L.17/25. Teeth require extraction. 11-3-3. Vision=R.17/100; L.17/16. Right lens possibly a trifle clearer. KI drops were used.

Case 6. Aged 53. 10-16-23. Cortical and nuclear opacities. Vision= R.17/70; L. Fingers 30 inches. 4-7-24. Vision=R.17/100; L, always amblyopic. Only two injections of lactogen, reaction severe. Said he was better after NaI drops; not confirmed.

Case 7. Aged 51. 10-19-23. Lens opacities near anterior capsule, subcapsular. Vision=R.17/100; L.17/25. 4-8-24. Cataracts progressing. Vision =L.17/70.

Case 8. Aged 77. 9-17-23. Loss of vision out of proportion to lens opacities. Floating opacities. Choroidal disturbance. R. posterior cortical; L., diffuse haziness. Vision=R.17/100; L.17/50. 4-23-24. Vision=R.17/50; L.17/50. Vision in December, 1923, R.17/40; L.17/33—.

Case 9. Aged 61. 11-4-23. Posterior cortical opacities. Floating opacities. Vision=R.17/50—; L.17/70. 4-6-24. Used NaI drops. Progress became rapid during month. Vision= R.17/200; L. fingers at 6 feet.

Case 10. Aged 70. 11-6-23. Peripheral lenticular opacities. Vision= R.17/16; L.17/25. 4-14-24. R.17/16; L.17/25. No change noted except slight increase in haze.

Case 11. Aged 77. 11-7-23. Lenticular haziness. Sclerosis of vessels. Vision=R.17/16; L.17/25. 4-14-24. Vision=R.17/16; L.17/25. Myopia developed the last two years.

Case 12. Aged 69. 11-1-23. Right posterior cortical, left general haziness. Vision=R.17/33; L.17/40—. 1-25-24. R.17/40—; L.17/100. Slow progress has continued.

Case 13. Aged 83. 11-9-23. Cortical. Family history cataracts. Vision= R.17/33—3; L.17/33. 4-8-24. R.17/ 20—4; L.17/20—5. No improvement seen.

Case 14. Aged 71. 11-16-23. Cortical. Vision=17/33; L.17/33. 12-11-23. R. 17/20—; L.17/25—1. Not seen later but reported vision has not shown any loss.

Case 15. Aged 66. 11-16-23. Fine cortical opacities. Postnuclear opacities. Vision=R.17/16; L.17/20. 4-5-24. R.17/16—; L.17/25. 2-1-24. Vision= R.17/16; L.17/16. NaI drops used.

Case 16. Aged 69. 11-19-23. Cortical. Vision=R.17/33—; L.17/20. 3-27-24. Vision=R.17/16—; L.17/16.

Improvement in reading letters, 8; stationary, 3; continued progression, 3; improved; patient's statement not confirmed by test, 2.

Turning to the opinions of some of our eminent colleagues, the following reports come from teachers in leading medical schools, as to remedies used with comments regarding same:

Robert G. Reese, Cornell University, does not think that anything is of much benefit.

Walter R. Parker, University of Michigan. Dionin, glycerin. Unable to tell whether cataracts have been influenced by treatments. Thinks that since lens is ectodermic in origin, cell changes take place due to chronic diseases assuming different refractive indices, and may appear as opacities. This accounting for various changes.

George E. de Schweinitz, University of Pennsylvania. Many varieties; and

behavior varies greatly. Thinks stimulation of anterior circulation, as by dionin, directly conserves nutrition of lens and possibly retards lens changes. Prefers NaI solution locally. Correction of refractive errors important. Internally NaI and Syr. Hydriodic acid have favorable alterative effect, particularly with choroidal disturbances accompanying.

Allen Greenwood, Tufts College. Dionin. Results gratifying except in nuclear type. Vision improved and held for a long time in some cases. Importance of high standard of body metabolism.

Eugene M. Blake, Yale University. Dionin, KI sol. Retardation and even improvement by increasing blood supply to anterior segment of globe. Hot applications. General treatment—alimentary canal, focal infections, and blood pressure. Oxycyanide of Hg. and NaCl sol. subconjunctivally of use but distasteful to patient.

Arthur N. Alling, Yale University. Does not believe it possible to have the slightest effect in retarding the progress of incipient cataract.

M. Feingold, Tulane University. Has not found anything to be of any help.

John M. Wheeler, Bellevue Hosp. Med. College. Not convinced as to the value of any measures.

Jas. C. Dowling, Howard University. Under routine treatment no immature cases during the past two years have progressed to operative stage. Has great faith in dionin. High frequency used and believes beneficial. NaI internally. Mag. sulph. twice weekly. Maintenance of general body nutrition. Hot compresses.

W. T. Davis, George Washington University. Dionin at times has apparently caused some clearing. Importance of medical survey, septic foci and high arterial tension if removed may have favorable effect.

Wm. R. Murray, U. of Minnesota. Careful physical examinations and removal of chronic infections. This together with dionin may retard but no evidence of having arrested other development of or having cleared an opacity.

Melville Black, University of Colorado. Feels that dionin is only remedy that has given any results as far as it is possible to judge and these have been favorable.

W. H. Wilmer, Georgetown University. Has used all suggested remedies except cytolytic serum. No treatment encouraging. Least discouraging method—removal of toxemia or foci of infection, iodin internally, dionin and heat locally.

W. H. Luedde, St. Louis University. General treatment better than local. Elimination of focal infections, correction of dietary indiscretions has given excellent results in considerable majority of cases.

Don M. Campbell, Detroit College of Medicine. Local treatment useless. Treat causes of contributing factors as uveitis, etc. Eradicate foci of infection. Visual improvement due to improvement of health of other ocular tissues.

James B. Stanford, University of Tennessee. Not convinced that any of the measures recommended were successful.

Adolph Pfingst, Louisville Medical College. Not convinced that any treatment has any bearing on progress of uncomplicated senile cataract.

Brown Pusey, Northwestern University. Has seen a few cases where the cleaning up of infections seemed to retard or stop the progress of opacity formation.

Edward F. Parker, S. Carolina State Medical College. Knows of nothing that definitely retards the progress of cataract. Uses dionin as something harmless and perhaps useful.

Hedges Compton, University of Virginia. Has not used anything that has had a direct appreciable effect. Retardation occurs with and without treatment. Study patient's nutrition.

W. F. Boiler, University of Iowa. No real success with any treatment; 25 cases—oxycyanide Hg. injections. No results. 50 cases NaI. drops plus Syr. hydriodic acid internally. Practically no results. 6 cases radium treatment—one case apparently benefited.

H. Gifford, University of Nebraska. Difficult to say what course any cataract is going to take. Knows of nothing better than dionin. Thinks cyanide

Hg. injections may check or even improve condition but loathe to urge it. Not sure whether anything does any good.

L. B. Bushman, Creighton University. Excellent results by removing foci of infection. Correction of refraction. Promoting good physical condition. Eye drops, dionin and NaI.

W. E. Shahan, Washington University. No treatment successful except where general treatment is indicated as in diabetes.

George H. Price, Vanderbilt School of Medicine. Believes it possible in some to retard, some improve, and some restore to normal vision. Results quite satisfactory. Remarkable in some. Dionin locally, KI. and bichlorid of Hg. internally.

George S. Derby, Harvard University. No remedy successful. Only those secondary to other eye diseases are influenced. In these cases sometimes improvement in general health may cause certain amount of clearing of lens opacities.

Arnold Knapp, Columbia University. Knows of nothing that will retard. Progress so irregular that it is difficult to ascribe to treatment carried out any apparent retardation.

J. F. Dickson, University of Oregon. Personally has never found anything that retarded progress of incipient cataract. Thinks reports from the use of radium offer the most promising results.

Wm. W. Blair, University of Pittsburgh. Only success has been in those under 50 where some focus of infection was removed, followed by dionin. Most satisfactory improvement in some of these cases.

E. S. Ferguson, University of Oklahoma. No real remedy. Limits treatment to proper refractive correction.

F. P. Calhoun, Emory University. Has never seen any drug or treatment that would definitely retard the progress of cataract.

Frank Morrison, University of Indiana. Opacities not affected. In cases where loss of vision out of proportion to opacity, improvement thru injection NaCl and dionin locally due to improvement of vitreous haze.

J. M. Hull, University of Georgia. Radium has given great relief in a number of cases. Knows of nothing else of benefit.

E. T. Brown, University of Vermont. Thinks that dionin and Hyd. cyanide drops with hot applications occasionally retard progress. Also gives KI and Hg. Bichlor. internally.

Gilbert J. Palen, Hahnemann Medical College, Philadelphia. 20% KI sol. locally and KI internally. Majority of cases have remained at a standstill, and in many, a disappearance of a great deal of lenticular haze.

Albert B. McKee, Stanford Medical College. Has found same variation in vision in series of untreated cases as in those subjected to radium treatment. No experience with other methods.

E. J. Curran, University of Kansas. Injections of NaCl, not repeated very often and only after extensive periodic use of dionin. Retardation and improvement in vision at least for a time in many cases. In some retardation apparently permanent, being under observation 5 and 6 years.

C. V. Roman, Meharry Medical College. Local absorbent remedies with suitable constitutional treatment frequently effective in retardation of progress.

E. H. Cary, Baylor University. Incipient cataracts due to toxic absorption frequently helped, depending upon location of opacities. Then dionin and subconjunctival injections are apparently of service.

E. V. L. Brown, University of Illinois. He has not found any measure which influences the progress of cataract. Suspicions that choroiditis is responsible for many and a striking number associated with ethmoiditis.

SUMMARY OF RESULTS

	No Benefit	Positive	Doubtful	Possible
Reese	1	..	..	..
Parker	..	..	1	..
DeSchweinitz	..	..	..	1
Greenwood	..	1	..	..
Blake	..	1	..	..
Alling	1	..	..	..
Dowling	..	1	..	..
Feingold	1	..	..	..
Wheeler	1	..	..	..
Davis	..	..	..	1
Murray	..	..	..	1
Black	..	..	..	1
Wilmer	1	..	..	..
Luedde	..	1	..	..
Campbell	1	local, 1	general	..
Stanford	1	..	..	..
Pfingst	1	..	..	..
Pusey	..	..	..	1

Parker	1	..	..	..	
Compton	1	..	..	..	
Boiler	1	..	..	..	
Gifford	..	..	i	i	
Bushman	..	i	..	..	
Shahan	i	..	..	..	
Price	..	i	..	..	
Derby	i	..	..	i	secondary
Hull	..	i	..	..	
Morrison	i	..	..	..	
Calhoun	1	..	..	..	
Ferguson	1	..	..	..	
Blair	..	i	..	..	
Dickson	i	..	..	..	
Knapp	1	..	..	..	
Brown	..	..	..	i	
Palen	..	i	..	..	
McKee	i	..	..	..	
Curran	..	i	..	..	
Roman	..	1	..	..	
Cary	..	..	..	i	
Brown	i	..	..	..	
	20	12	2	9	

Dionin, iodin therapy, locally and internally, together with dietetic supervision, the removal of foci of infection and the improvement of general metabolism, practically include the treatment carried out by the majority of ophthalmologists.

It is much more gratifying to the self pride in each of us, to present constructive work that has culminated successfully. The conclusions to be reached in this question come from simple clinical observations substantiated by the patients. The optimistic views of medical writers, when placed by the side of the opinions of a group of our ophthalmologic teachers, cannot help but make one feel that something is wrong. The scientific recording of facts cannot assimilate all these observations.

First as to the small series presented. Fifty per cent showed improvement; twelve per cent said they were better, but statements were not confirmed; eighteen per cent seemed retarded, by not being worse; and in eighteen per cent progress continued. When one considers the irregularity in the progress of cataracts, the small number in this series, the short time of treatment, the small amount of improvement, and the lack of a series of untreated cases to check against, it is impossible to draw any conclusions. In fact, it is presented as a series without any value, simply to emphasize that our literature, becoming increasingly voluminous should demand that enthusiastic medical writers should carefully weigh the evidence at hand before announcing success in any line of treatment. It is a commonly expressed sentiment that one can only believe a small part, of many opinions often expressed as facts in our current literature.

Secondly, after studying this subject one can come to no real conclusions. Speaking for the large army of ophthalmologists in private practice who can give, and desire that their patients have, the advantage of any treatment of proven worth, it is to be regretted that the information desired is so often not available. With these men economic conditions, both as to their own time and their patients', limits experimental practice.

The preeminent worth of scientific conclusions in medicine still lies in their applicability to relief of the afflicted. If our profession is more than an art and is to progress as a science, there should be a concerted effort upon the part of those working in clinical and teaching centers to work together and solve some of these mooted questions of therapy.

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NOTES, CASES, INSTRUMENTS

CONGENITAL ATRESIA OF ALL LACRIMAL PUNCTA WITH ABSENCE OF SALIVARY GLANDS.*

FRANCIS BURTON BLACKMAR, M. D.

COLUMBUS, GA.

A white schoolboy, eleven years of age, was seen in the clinic of the New Orleans Eye, Ear, Nose and Throat Hospital on September 30, 1922. It was noted that the patient's tongue was dry and fissured. This condition was said to have existed since birth. The tongue resembled that of an unconscious patient, who had allowed the mouth to hang open and the tongue idle for a long time. There was no history of mouth breathing. During the examination of the mouth and throat, small droplets of yellow mucoid material were seen to collect on the roof of the mouth. All of the teeth were badly discolored and many were almost destroyed by caries. (Possibly the dry condition of the mouth lowered the sensitivity of the mucous membrane, making it impossible for the patient to keep his teeth clean with his tongue. Thus particles of food were allowed to accumulate, resulting in the carious condition).

A Wassermann and urinalysis were negative. There was a slight emphysema of the lungs, secondary to asthma. Potassium iodid and bicarbonate of soda were prescribed. Altho this resulted in a mouth which was slightly moist and much more comfortable, there was still not enough flow of saliva to be swallowed, or collected in a syringe, even after prolonged chewing of gum. The nasal mucous membrane was apparently normal.

The cilia of both eyes were matted together by mucoid secretion. The mother stated that the eyes had been in this condition since infancy and the inflammation had never been more marked than now. There was practically no conjunctival injection. Vision was 6/6 in each eye. There was no superior or inferior punctum demonstrable in either eye; altho their normal situation was indicated by slight, smooth elevations on the lower lids only. No history of epiphora was obtainable. An attempt was made with a Graefe knife to open a possible hidden canaliculus which might be present and covered over. Fluorescein was instilled in both eyes and the nose inspected and swabbed at intervals, without a trace of the stain appearing. A search for the nasal orifices of the lacrimal ducts with a nasopharyngoscope was unsatisfactory. However, the crying induced gave conclusive proof of a copious lacrimal secretion when properly stimulated. With eyes occluded, salt, sugar, pepper and acetic acid were applied to the tongue. All were quickly and accurately recognized. Keeping the buccal region in view, electric stimulation was applied to the parotid glands, but no secretion could be demonstrated. No ostium could be found to any duct by inspection of the mouth, or by exploration with a sound.

Cases of congenital atresia of the lacrimal puncta are not at all common. On the other hand atresia of the *nasal* end of the duct is not uncommon, seventeen cases having occurred in one German clinic in six months. The difference in the frequency of their occurence may be explained by the development of the lacrimal apparatus. At six weeks a groove appears on the embryo from the inner canthus to the ala of the nose. From the floor of this groove a cord of cells migrates into the deep tissues and is pinched off from the surface. The groove disappears and the lower end of the cord extends to the nasal mucous membrane. The upper end forks and the branches push out to the conjunctival surface, carrying a mass of tissue along which forms the caruncle. The central cells of the epithelial cord then liquify and form the lumen of the lacrimal drainage apparatus.[1] The lower end ruptures into the nose, due to cell atrophy from tension as the duct enlarges, becoming patent only at about the time of birth.[2] The canaliculi,

*Read before New Orleans Eye, Ear, Nose and Throat Club, May, 1923.

however, become patent in the 35 mm. embryo. Apparently the failure of the puncta to form is due to a low "potentiality of development of the anlage of the duct system."[2] By birth sufficient time has lapsed for it to have progressed to patency, and so a spontaneous opening is not to be expected. On the other hand, the lower end remains narrowly constricted until just before birth. Then the lumen begins to enlarge, tearing open the epithelial veil.

Cases of congenital occlusion of one or more of the lacrimal puncta have been reported by von Hippel[5], Ferron[4], Nielson[6], Bernhardt[3], Fox[7] and Gradle[1].

In this case the congenital absence of serous salivary glands suggests, that there may also be an absence of the lacrimal drainage system as a whole. However, at the present, no way has been thought of to determine whether this is, or is not, the case.

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SPASM OF CENTRAL RETINAL ARTERY.

L. L. McCoy, M.D.

SEATTLE, WASHINGTON.

Mrs. K.—age 72—was seen on July 19, 1924, about 3 p. m. She gave the following history: Two hours before, directly after lunch, the left eye suddenly became blind. There were no other symptoms. She had experienced several attacks of obscuration of vision during the past year, but each attack lasted only a few minutes and was noticed only in the left eye. She had worn glasses seven years, and for some time near work had been very difficult. She had been told by her family physician that she was suffering from a kidney affection but no definite history could be obtained. She was very nervous and had been for years. The rest of her history was irrelevant.

Examination: Vision R.20/100 and with glass 20/25; L. hand movements at 6 inches. Lids, conjunctiva and cornea were normal for her age. Muscle action normal. Anterior chambers normal in depth. The irides were slightly atrophic; the pupils were slightly dilated (5-6 mm.), were round and reacted fairly well to light and accommodation, the left being less active than the right. The lenses showed many radiating opacities especially below. There was a large, spoke like opacity extending diagonally across the center of the left lens and apparently producing the prismatic effect which the patient sometimes perceived when looking at lights. The right vitreous, fundus and disc were normal except for a moderate amount of arteriosclerosis of the vessels. The left vitreous was clear (no floating opacities), the fundus was quite anemic with the macular region normal in color. The disc was sharply outlined and the color normal. The fundal veins were slightly distended and seemed rather darker than normal against the pale background. There was no tortuosity of the vessels and no hemorrhages. The arteries were very narrow with sev-

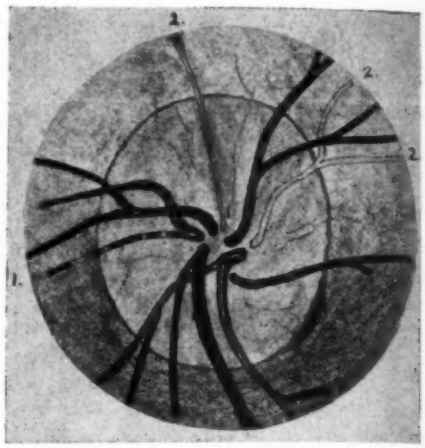


Fig. 1. Diagram of disc and vessels shortly after treatment was begun. 1. Beaded appearance of nasal branch. 2. Empty vessels.

eral of the branches practically white, particularly those above; one of the branches nasally was beaded in appearance.

With the condition of embolism of the central retinal artery in mind and the short time since onset, gentle massage of the eyeball, together with inhalations of amyl nitrite at five minute intervals, were begun at once, and close watch of the condition was kept with the ophthalmoscope. Very shortly (10-15 minutes) after the above measures were instituted the arteries began to refill and soon the color of the fundus to return. Treatment was continued (30-45 minutes) until all the arteries appeared quite normal and vision had improved to counting of fingers at a few feet. The upper nasal branch was the last to become reestablished. Still thinking that perhaps an embolus had been dislodged and forced into an end artery, the patient was given some pearls of amyl nitrite to use at home in case another attack occurred and sent home, to return in one week for another examination. One week later the fundus looked practically normal, except for some small atrophic areas in the choroid, which were irregularly situated, but mostly on the nasal side of the disc. The vessels were quite normal in appearance and vision was 20/200. Because of the appearance of the fundus and of the indefinite history of a kidney affection, a urine examination was made, which showed a slight trace of albumin, an occasional pus cell, and many bacteria. One week later the patient returned with no further developments and was refracted. No improvement could be obtained in the left eye, the vision remaining 20/200. 20/20 vision was obtained in the right eye with plus 3.25 sph. with a plus 0.50 cyl. axis 90°, and a plus 3.00 sphere added for near. The final fundus examination showed no signs of an embolus because there was no area devoid of blood supply as is the result of an embolus in an end artery.

Conclusions: 1. The condition was one of spasm of the central retinal artery rather than embolism.

2. Massage of the eyeball together with some vasodilator such as amyl nitrite may be very beneficial if instituted as early as possible after onset.

TRAUMATIC PULSATING EXOPHTHALMOS.

I. D. KRUSKAL, M. D.

BROOKLYN, N. Y.

Read before the Brooklyn Ophthalmological Society, October, 1924.

The infrequency of pulsating exophthalmos makes each individual case of interest to the observer and justifies a detailed description.

L. L. Age 28, male, was admitted on the 6th of August, 1923, to the Jewish Hospital, in the surgical service of Doctor William Linder. The following history was obtained from the family:

Three days ago the patient was in an automobile accident, was thrown from the machine, was picked up unconscious and taken to the nearest hospital. He remained at that hospital for three days, and at the request of his family was removed to a hospital in Brooklyn, where I saw him by courtesy of the attending surgeon. The patient was admitted with the diagnosis of a fracture of the base of the skull. He was unconscious on admission and remained unconscious, or only partly conscious for about three weeks. Lumbar puncture gave about 30 cc. of bloody fluid under increased pressure. I saw him on the afternoon of Aug. 6th, and the eye findings then were as follows:

There was marked conjunctival chemosis, more marked on the left side, so that the conjunctiva protruded between the lid margins. There was a moderate proptosis of the left eye. The cornea of the left eye was hazy, obscuring fundus details. The right pupil was small, regular and reacted sluggishly to light. The left pupil was about 4 mm. wide and did not react to light directly. Examination on August 7th showed that the right fundus was normal, the left showed a disc which was blurred, with indistinct outline. The vessels were distended and

tortuous, and there were a few small hemorrhages scattered thruout.

The next examination was six days later. The patient was partly conscious. The findings of the left eye were as follows:

The chemosis less marked than on previous examination—moderate ptosis of the left upper lid. The proptosis remained unchanged. The eye was fixed and did not move in any direction. The pupil was moderately dilated, did not react to light directly but reacted consensually. Ophthalmoscopy revealed a swollen disc, with margins blurred and obliterated; the retinal veins were dark, distended and tortuous, and a number of small hemorrhages, presenting a definite picture of an optic neuritis.

The patient was deaf in both ears, and the examination of the ears presented the following:

No evidence of any inflammation or hemorrhages in middle ear. Both drums were intact and looked normal. Hearing gone on both sides, altho there was bone conduction present. From these findings one could assume that there was injury to the labyrinth, or auditory nerves. The eye findings on the 31st of August were as follows:

Right eye pupil moderate in size, reacts normally to light, ocular movements normal, and the fundus negative. Left eye moderate proptosis and chemosis; distended conjunctival and episcleral vessels, ptosis of the upper lid. The eye moved slightly outward, no motion in other directions. The pupil was widely dilated, no direct reaction to light, but consensual reaction was present. The eye was amaurotic. Fundus examination, disc swollen, outline obliterated, vessels interrupted, veins engorged and tortuous, many fine superficial hemorrhages, beginning pallor of the temporal side of disc. A very definite optic neuritis.

My conclusions at this time were that the patient had an extensive hemorrhage in the orbit, causing the proptosis, the fixed eye, and the optic neuritis. The blindness was produced by either a hemorrhage in the sheath of the optic nerve, or a fracture through the optic foramen. The beginning pallor of the optic disc, and the fact that the vision did not improve led me to believe that the latter was the cause of the blindness.

About three weeks later he complained to the interne of a peculiar whizzing noise in his head, like the sound of rushing water. I saw him the afternoon of the same day, and the examination revealed a very pronounced pulsation when the left eyeball was pushed backward into the orbit. Auscultation over the left eye, left frontal and temporal regions, elicited a loud blowing bruit. All the other findings remained unchanged, except that the conjunctival and episcleral vessels were dilated and the pallor of the disc was more marked. Both pulsation and bruit were stopped by digital compression of the common carotid artery on the same side. The patient left the hospital shortly thereafter and I did not see him again until January, 1924. All the findings were exactly as previously recorded, except that the examination of the fundus showed a well marked postneuritic optic atrophy. The eye was moderately proptosed, the upper lid drooped; the episcleral vessels were distended, the pupil moderately dilated, and did not react to light; pulsation and bruit remained unchanged. After repeated efforts I was finally able to get in touch with him in September, 1924, and he reported to the office for examination. The eye findings then were exactly as recorded in the previous examination. He consented to a radiography of the head and I am indebted to Doctor Dixon for the report:

"Evidence of a fracture of the base of the skull, but the only one I have been able to show is an oblique fracture through the frontal process of the right malar bone just below the suture. There is a rather sharp downward bend of the left lesser wing of the sphenoid just external to the optic foramen, and there is a similar bend of the right but not so marked. This can hardly be regarded as a fracture, but it looks suspicious, especially in view of his eye trouble. The left optic foramen seems to be contracted below, but

no line of fracture is apparent. The left frontal is well developed and clear. The right is small and cloudy, probably due to its size. There is some thickening in the right ethmoids, and in both antra. As the patient is deaf, both mastoids were examined. They are both normal, of pneumatic type. No fracture was demonstrated in this vicinity."

SOCIETY PROCEEDINGS

Reports for this department should be sent at the earliest date practicable to Dr. Harry S. Gradle, 22 E. Washington St., Chicago, Illinois. These reports should present briefly scientific papers and discussions, include date of the meeting and should be signed by the Reporter or Secretary. Complete papers should not be included in such reports; but should be promptly sent to the Editor as read before the Society.

THE ROYAL SOCIETY OF MEDICINE.

Section of Ophthalmology.

November 14th.

PRESIDENT, SIR ARNOLD LAWSON.

Implantation Cyst, Retinal Pigmentation, Traumatic Blindness.

MR. BASIL LANG showed three cases. One was an implantation cyst, which he brought for the purpose of comparison with a recently shown case of double inplantation cyst. The second patient showed what seemed like congential pigmentation in the deep retina or in the superficial choroid. The third was that of a man who had a blow over an eye, which subsequently went blind. He thought it probably was a syphilitic choroidoretinitis.

Anchyloblepharon.

DR. ROSA FORD exhibited father and daughter with congenital anchyloblepharon. The father, now aged 34, was operated upon at four years of age, and now felt no disability. The child had the external canthi slit last July, and was now able to open her eyes much better, and did not have to raise the lids so much when making the effort.

MISS I. C. MANN showed on the epidiascope microphotographs of the human eye in various stages of intrauterine life. The condition in these two patients was probably due to the fusion of lids, which usually terminated at the seventh month, having persisted. The father showed absence of the levator palpebrae superioris. The child probably had the same abnormality, but was difficult to examine.

Macular Degeneration.

MR. H. A. LEVY showed two cases of macular disease. In the first, in a boy, it was observed from the beginning, the first complaint being of a little failure of vision. In three months it gradually developed until the whole macula was surrounded by pigmentary disturbance. The other case was in a girl, aged 18, who, in the last month, had developed a patch on the macula of the left eye, and he did not know the nature of it as Wassermann, von Pirquet and other reactions were negative.

Cavernous Atrophy and Glaucoma.

MR. RANSOM PICKARD read a paper on this subject, in which he contended that cavernous atrophy was a distinct entity. Its association, he said, with glaucoma was merely casual, not causal. It might exist without glaucoma and present symptoms somewhat resembling the latter disease, or it might coexist with it, and one might influence the course and appearance of the other. He founded his thesis on seven cases, which he described in detail. None of the cases had nerve symptoms, apart from the condition of the optic nerves. The discs were pale where the lamina cribrosa was exposed, but not elsewhere, and the vessels were not contracted. The question arose as to whether these cases were clinical entities, and whether they tended to develop general nerve symptoms if the patients lived long enough. They differed from cases of ultimate optic atrophy, as there was an absence of the dead-white color, the vessels were either not contracted or only slightly so, and there were

large discs and deep cups. In none of the 7 cases was the tension over 28 mm. of mercury, in most it was well below this. Cases seen for long periods showed no change at all; they seemed to arrive at a certain stage, and not to progress thereafter.

Discussion. MR. HEPBURN said he would fear to leave doubtful cases without recommending operation.

MR. G. H. POOLEY said he went over a large number of charts of cases of chronic glaucoma, and other cases closely resembling the condition, which he had seen in the last number of years. The chief omission in the paper was that of histories of progress of the cases, for the chief difference was as to whether the cases continued to advance, and if so, whether they could be arrested by the ordinary treatment for glaucoma. One case he saw showed no alteration in the fields in four years.

MR. LESLIE PATON spoke of a case of the condition Mr. Pickard described, which had been under his own observation 15 years, and before that was under Mr. Priestley Smith, who, long before the work of Schnabel, pointed out that it was not a case of glaucoma. The man was a myope of 15 D. The first field Mr. Paton took of him was limited to the 10° circle, and there had been no change in it in all the years since. In another probable case, also, there had been no progress whatever. He did not regard the condition as common.

MR. PICKARD replied, emphasizing again the fact, that after a certain stage was reached no further progress took place. It was difficult to forecast whether a case would be of short or long duration. Mr. William Lang's case made no progress in 14 years. He had seen cases of the kind which had been operated upon, and the eye went downhill. There was a similar condition in the other eye. He asked that special attention should be given to apparent cases of glaucoma but in which there was no tension.

Miners' Nystagmus.

DR. FREELAND FERGUS (of Glasgow) read a paper on this subject. He said, that in ordinary cases its diagnosis was not difficult. The oscillatory movements of the eyeball were not always present, but there were frontal and occipital headache, tremors of the head, vascular disturbances, photophobia, vertigo, and usually a history of the onset of visual disturbances. This, he thought, suggested a wide involvement of nerve centers. Photophobia was sometimes absent, but visual acuity was practically always reduced; and this latter was of considerable value, where the diagnosis was doubtful.

One such doubtful case was that of a miner in a district which showed little nystagmus. This man was certified, some years ago, as having miners' nystagmus, by both the examining surgeon and the referee who examined him on appeal. Recently the diagnosis was questioned, and then it was found that the man's condition had altered considerably: he was using a stick for getting about, and was suffering from disturbance of innervation of some of the leg muscles. There were neither head tremors nor photophobia, but the patellar reflexes were exaggerated and ankle clonus was absent. No oscillatory movements of the eyes were evident on examination, and the positive range of convergence for the median position was excellent; but on extreme upward fixation there was definite diplopia. The pupils reacted regularly, tho somewhat sluggishly, to light; there was no ptosis. There was no serious error of refraction, nor could he find tremulous movements in either eye, and their fundi were healthy. In each eye the visual acuteness was practically 6/6. There might, he said, be nystagmus with diminished visual acuteness without the case being one of miners' nystagmus. Still, given a mine worker with nystagmus and diminished vision, the evidence of the presence of other causes of nystagmus must be satisfactory before a negative conclusion as regards miners' nystagmus was arrived at.

Low visual acuteness in miners' nystagmus might be due to one of two causes, or to a combination of

them. The first was, that the rapid movements of the eyes prevented the proper stimulation of the maculae. In the second place it must be remembered that there was, in almost all cases of the disease, considerable pain at the back of the head, and this might indicate a lesion at the pole of the occipital cortex, involving the centers concerned with visual acuteness.

In one of his cases the man had excellent vision, and a certifying surgeon diagnosed the case as miners' nystagmus. With that the speaker could not agree. Only the left eye was said to be affected, and the man had been away from work four months. Diplopia was permanently present, due to an affection of the left eye, the vision of which was 6/6 (Snellen). The man had been operated upon for ethmoidal disease. There was no photophobia, no head tremors, and the man had not seen lights appear to revolve. In certain parts of the upper field of fixation there were to be seen those jerky movements which had received the name "pseudonystagmus."

Dr. Fergus did not consider that miners' nystagmus had yet been satisfactorily explained. It did not seem to be due to either posture or defective illumination; or to the depth of the pit in which the men worked. He had seen cases from pits which were comparatively shallow. Mr. Robson, who had conducted an admirable statistical research, attributed it to working in certain soft kinds of coal. Still, cases of it did occur in workers on hard and bright coal.

A considerable number of cerebral centers seemed to be involved in the disease, and those centers were probably coordinated to each other. But the causal agent did not seem to affect any centers in the medulla or cord. He had thought it might be due to a definite and specific microorganism, and this might explain cases of the condition being more abundant in some districts than in others. In support of the idea was the fact that miners' nystagmus was accompanied by a good deal of constitutional, and even mental, disturbance. He was not aware of any *postmortem* examinations having been made on cases of the disease. If such, with bacteriologic examinations, were made, much light might be thrown on the subject. The blood and cerebrospinal fluid might be examined in living subjects. The Ministry of Health, he suggested, might arrange for a competent set of men to make a careful inquiry into the matter, including an investigation of the sanitary condition of the pits where it was prevalent.

Discussion. THE PRESIDENT said it had been admitted in discussions that defective illumination was a main cause of miners' nystagmus, and it had been confidently stated that in mines where the lighting was improved the amount of nystagmus had diminished. With regard to diminution of sight in the disease, it was generally recognized that there was a physiologic central scotoma in most of these cases.

DR. ROBSON (of Penarth, S. Wales) entered into a detailed consideration of the subject, and said he thought most medical men practising in the vicinity of coalfields would incline to the idea that the disease was a central rather than a local one. In some coal areas in Scotland there was no miners' nystagmus; conversely, in some mines there were particular seams which were responsible for all the cases of the disease in the mine; yet all in the mine were working under the same conditions as to temperature, depth and pressure. It seemed to be a matter of the environment rather than a personal idiosyncrasy of the worker.

There was no nystagmus in American coal mines, or in those of South Africa. In New South Wales nystagmus raged especially in pits where the coal was liable to spontaneous combustion; it became quite hot if left for only the time between two shifts. There was no proof that there had been a steady reduction of nystagmus following the adoption of the electric headlight. He considered that miners' nystagmus was a question of some derangement of the central neurons of the brain. He believed there was no nystagmus in America because the pits

were shallow; some were not more than 500 feet in depth, and there were huge ventilation plants, with, sometimes, 200,000 cubic feet of air passing in at a time. In South Wales there were deep pits, and there was not very complete ventilation.

Mr. G. H. Pooley (Sheffield) contended that the number of miners claiming compensation was no criterion of the number of cases of miners' nystagmus. In order to arrive at dependable statistics, every man working in a mine should be examined. The movements of the eyeballs in miners' nystagmus were definitely undulatory, not a slow movement in one direction and then a quick return, as in labyrinthine nystagmus. In workers in coal mines wounds of the cornea were more likely to be infective than in the case of steel workers. He was not greatly inclined towards the cerebral idea of this disease. He spoke of the cases now seen in which prolonged abstention from work produced a pitiable nervous condition in the men, of a severity which was not seen before the payment of compensation became the rule. Before that time, men often returned to their work within three months.

Mr. Harrison Butler said many cases of miners' nystagmus had no definite diminution of vision when errors of refraction were corrected and the test types were placed low down.

Mr. R. J. Coulter agreed with Mr. Butler.

Mr. Bernard Cridland could not agree with the last two speakers. He pointed out that miners' nystagmus was practically absent in candle lighted mines, but present in those lighted by lamps, and if a candle would not burn in a mine, a man working in such must suffer in health.

Mr. J. W. Thomas drew special attention to the physical characteristics of the coal face. Soft coal was of a uniform dull blacknes, and therefore reflected little light, a factor which should be taken into account in trying to account for this condition. The electric cap-lamps illuminated the coal a hundred times more than did the ordinary lamps used underground.

Dr. Fergus replied.

H. Dickinson.

THE NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.

November 17, 1924.

Dr. Robert Sullivan, Chairman.

Glaucoma Simplex

Dr. Herschel Ezell showed Mr. J. S. age 74. Five years ago the patient developed recurrent pain and impaired vision in each eye. After each attack the vision grew progressively worse until within two years it was practically destroyed. Three years ago he consulted Dr. Ezell. Examination at that time showed that in each eye the vision was only P. L. Both corneas were hazy, the pupils were widely dilated, pupillary reaction was absent both to light and to accommodation, the optic discs were deeply cupped, and the retinal arteries and veins were completely lost on entering the nervehead. The fields could not be taken on account of poor vision. A diagnosis of bilateral chronic glaucoma was made. Operation was advised but declined. Eserin solution was prescribed. The eyes remained comfortable for about three years. One month ago, however, the patient returned to Dr. Ezell complaining that for the past few days he had had unbearable pain in the right eye.

Examination revealed: No vision could be demonstrated in the right eye. The eye is considerably inflamed. The pupil is slightly contracted. The iris is without luster. The fundus is seen with great difficulty. The left eye is blind, quiet, and the fundus is seen with difficulty.

Operation was again advised, but refused. Eserin solution was prescribed, together with a 1% solution of butyn to relieve the pain in the right eye.

Discussion. Dr. Hilliard Wood. The eye is blind. There is, I take it, total optic atrophy, after which vision can not be restored. Any effort, therefore, to restore vision would seem futile.

The next indication is to relieve pain. That might be done by some decompression operation, such as trephining, iridotasis, etc. The pain could be relieved, of course, by enucleation. My own feeling is that any decompression operation in such an eye is probably doomed to fail even to relieve pain, for the reason that in a long standing case of high tension the degeneration which takes place thruout the eyeball affects also the intraocular vessels, and an effort to relieve the tension of that eye by any decompression operation will likely be followed by intraocular hemorrhage, necessitating enucleation of the eye. The only eye that I now recall on which I operated under similar conditions, i. e., an old blind glaucomatous eye in which I did a trephining, was followed by intraocular hemorrhage. That eye I had to remove later. My belief is that in this case any operation to relieve tension will most likely be followed by intraocular hemorrhage. Probably the best plan would be to enucleate, that is if the pain is sufficient to justify operation to relieve it, and if the pain is not relieved therapeutically by the use of eserin.

DR. EZELL (closing). I want to impress upon you that this is the second attack this patient has had, the first being five years ago.

FRED E. HASTY,
Secretary-Editor.

COLORADO OPHTHALMOLOGICAL SOCIETY.

October 18, 1924

DR. J. A. PATTERSON, Presiding.

Herpes Zoster Ophthalmicus.

E. M. MARBOURG, Colorado Springs, presented a remarkable case of herpes zoster ophthalmicus. The active condition had occurred in December, 1923. There were cicatrices over the entire frontal area and extending back to the occiput. The hair had been lost over the entire right side of head. There were long cicatricial bands across the nasal angle of the right orbit, and the right upper eyelid was completely everted as a result of cicatricial contraction of the skin of the lid. There was a leucoma of the right cornea, and the right fifth nerve was partially anesthetic.

Discussion. EDWARD JACKSON, Denver. This is the most extensive case of ophthalmic herpes zoster which I have ever seen.

E. R. NEEPER, Colorado Springs. I have three cases under treatment, one in a very healthy young man. In this case there is one band of disturbance immediately below the nostril on the upper lip and five points on the eyeball.

J. A. PATTERSON, Colorado Springs. Many of these patients have been chilled, and the disease often seems to be associated with sinus conditions.

W. C. FINNOFF, Denver. A boy under my care at the present time has his second attack, the first having occurred three years ago. There is a large ulcer covering the whole lower segment of the cornea. The unusual feature of the case is that the first attack occurred at the age of nine years.

DR. E. R. NEEPER. I think Fuchs mentions a case as early as two years.

Pigmented Cyst of Iris.

E. M. MARBOURG, Colorado Springs, presented a negro woman aged fifty years who had come on account of failure of vision of the right eye, noticed for the past two or three years. This eye had a mature cataract, and at the lower inner quadrant of the pupil was a regular brown mass two or three millimeters in diameter attached to the pupillary margin.

Discussion. W. C. FINNOFF, Denver. I think this is definitely a cyst between the layers of the pigmented epithelium on the posterior surface of the iris. It does not transilluminate because of the dense pigment.

Vernal Catarrh.

E. R. NEEPER, Colorado Springs, presented a child aged eleven years who had come because the eyes were red and itching. Two other children who had been using the same towel had normal eyes. Tonsils and adenoids had been removed from the patient.

The palpebral conjunctiva was pale and had large flat masses above and at the ends of the tarsus. Elsewhere the conjunctiva was slightly rough. The patient had been much relieved by an ointment containing two per cent of sodium salicylate. Was the condition trachoma or vernal conjunctivitis?

Discussion. W. C. FINNOFF, Denver. When vernal conjunctivitis is suspected, the first thing to do is to make a smear from the conjunctiva, and stain it with Wright's or the Giemsa stain to see whether eosinophiles are present. I have a case which was treated as trachoma thirteen years ago, but in which there is a ropy secretion, and after eosinophiles had been demonstrated fibrolysin gave prompt relief.

EDWARD JACKSON, Denver. Dr. Emory Hill has suggested applying dionin to the conjunctiva to produce an abundance of secretion containing eosinophiles.

Injury by Arrow, Late Results.

E. R. NEEPER, Colorado Springs, presented a boy, aged twelve years, who at three years of age had been struck in the left eye with a toy arrow. Iris and vitreous prolapse had been excised, and the wound covered with conjunctiva. There were remains of the lens, and cholesterin deposits. Professor Fuchs had suggested leaving the lens remains and advancing the internal rectus on account of an external strabismus of this eye.

Treatment of Mole on Lids.

E. R. NEEPER, Colorado Springs, presented a girl aged eight years, who had what apparently was a pigmented mole at the inner end of the upper and lower lids of the right eye. The condition had been treated with radium about a year before.

Discussion. W. C. FINNOFF, Denver. After the secretion was removed the growth looked rather more like staphyloma. I suspect that the radium was used in an insufficient dose, and that if a heavier dose had been employed we should now see a scar in place of the growth.

Incipient Cataract.

E. R. NEEPER, Colorado Springs, presented a woman, aged fifty-eight years, the vision of whose left eye had fallen to 10/120. There were a number of vacuoles in the cortex of the crystalline lens. All reports with regard to the patient were negative except as to the tonsils, which had been removed and found very necrotic. The patient was taking dionin locally and potassium iodide internally.

Discussion. D. A. STRICKLER, Denver, suggested the use of the combination of dionin and cyanide of mercury proposed by Jones of Cumberland, Maryland.

W. A. SEDWICK, Denver, thought that he had had some success in a similar case from the use of a combination of one-tenth of a grain of dionin with one grain of sodium iodide in an ounce of water.

Vernal Conjunctivitis.

J. A. PATTERSON, Colorado Springs, presented a child who had had vernal conjunctivitis of long duration. The principal complaint had been of lacrimation, photophobia, and congestion. There had not been much itching except at bedtime. There was intense thickening and redness of the bulbar conjunctiva at the limbus, more marked opposite the palpebral aperture. The diagnosis was made on account of the extreme pallor of the palpebral mucosa, altho there was no elevation of the tarsal conjunctiva, the only further change in the eyelids being some thickening and redness in the retrotarsal fold. The refractive correction was:

R.—5.00 sph. +2.75 cyl. ax. 30°; L.+0.75 sph. +1.00 cyl. ax. 180°

The vision obtained with these lenses was R 6/25; L. 6/6. Many remedies had been tried without much relief, the greatest benefit being obtained from cauterizing the affected areas with trichloracetic acid in saturated solution, immediately neutralized with sodium bicarbonate solution. In May last, under general anesthesia, a peridectomy had been done on the right eye, and in the left eye

the hypertrophied tissue had been partly removed and partly turned under as in a pterygium operation. Considerable improvement followed this procedure. The use of radium had been advised, but only recently accepted, and it seemed to be producing marked improvement. (At a later date Dr. Patterson reported to the secretary that considerable greater improvement had been obtained from the further use of radium.)

Discussion. W. C. BANE, Denver. The case has not impressed me as one of vernal conjunctivitis, but as one of episcleritis.

W. A. SEDWICK, Denver, referred to a case in which there had been a typical tessellated arrangement of the palpebral conjunctiva, and in which radium, the only remedy employed, had been completely successful.

Retrobulbar Neuritis.

J. A. PATTERSON, Colorado Springs, presented a man, aged forty-seven years, who had come complaining of the appearance of waves before the right eye, and sometimes of a black mist or circle, dating back for three weeks. This eye had been distinctly the weaker one since a severe attack of influenza last spring. Refractive correction brought the vision of the right eye up to 6/12, and that of the left to 6/7. There was a relative scotoma between twenty-three and thirty-three degrees upward and a hundred and twenty and 55 degrees laterally, with a positive scotoma forming the nasal border of the relative scotoma. Wassermann test was distinctively negative, but vision had improved under mixed treatment and the use of correcting lenses.

Discussion. D. A. STRICKLER, Denver, suggested X-ray investigation of the nasal sinuses.

Episcleritis. Persistent Canal of Cloquet.

J. A. PATTERSON, Colorado Springs, presented a man, aged forty-six years, who had come on account of pain and redness in the right eye, with marked tumefaction of the nasal half of the eyeball. The conjunctiva was greatly thickened and of the color of beefsteak. The pupil was active, the eye was tender on palpation, and tension was plus one. This eye had never been other than useless as long as the patient could remember. It presented slight external strabismus, and only had vision of large objects to the temporal side. The pain and increased tension were immediately relieved by the use of a mydriatic. The patient had come to Colorado in 1911 for tuberculosis, had stayed in bed for two years, and then had lived a quiet life for another year, when his disease was said to have been arrested.

The same eye also presented a large mass in the vitreous which came forward toward the lens and divided into two bands. This mass partly covered the lower part of the optic nerve, the entrance of which into the eyeball was tilted. There were numerous areas of atrophy and pigment migration underlying the retinal vessels, and more noticeable in the central region and to the temporal side.

Discussion. EDWARD JACKSON, Denver. This is a very striking fundus, worthy of a good deal of study. We probably have a congenital remains of the hyaloid canal. It is somewhat funnel shaped, has a perfectly regular outline, comes right forward to the lens, and extends backward as far as we can see toward the disc, where it seems to have two attachments, one to the lower temporal vessels. I do not think that this has any connection with the attacks of inflammation, except that a weak or imperfect eyeball is more subject to unfavorable influences. The external condition seems to come nearest to a certain form of episcleritis, one case of which I saw in a tuberculous patient.

WM. H. CRISP, Secretary.

OPHTHALMIC INSTRUMENTS OF SCIENTIFIC PRECISION.

This Section of the AMERICAN JOURNAL OF OPHTHALMOLOGY is intended primarily to present to the Ophthalmic Public the mechanics and use of the modern accepted instruments of precision. These are to be described and illustrated from a purely impersonal standpoint without clinical claims and apart from all commercial taint. It is the hope of the Editor that any reader who has had especial experience with any particular instrument will offer the benefit of his knowledge. However, the Editor reserves the right to wield a healthy blue pencil in order that the contributions may comform to the aims. H. S. G.

THE SLITLAMP.

ARTHUR J. BEDELL, M.D.

ALBANY, N. Y.

On the Continent they call the combination of the Gullstrand slitlamp and the binocular corneal microscope the Slitlamp. We in America should do likewise. The essential parts of this combination instrument are three, the lighting unit, the microscope, and the head and chin rest.

The lighting unit of one instrument may be carefully studied in Fig. 1. The elevating screw *a*, the rotation dial marked in degrees *b*, the set-screw for the slide *c*, *d*, the slide, *e*, the roller bearings, *f*, the lamp housing, *g*, the adjusting screws for centering the lamp, *h*, the set-screw which holds in position the slit mechanism, *i* controls the size of slit opening, *j*, the diaphragm with three openings, *k*, a holder which is arranged so as to receive either a solid light filter or trough of fluid, *l*, the light excluding sleeve, *m*, the double lens, one with a 7 cm. and the other with 10 cm. focus. These are so mounted that it is possible to change from one to the other by simply rotating them; *n*, first surface metal mirror with a ball and socket joint mounted to an adjustable rod making it

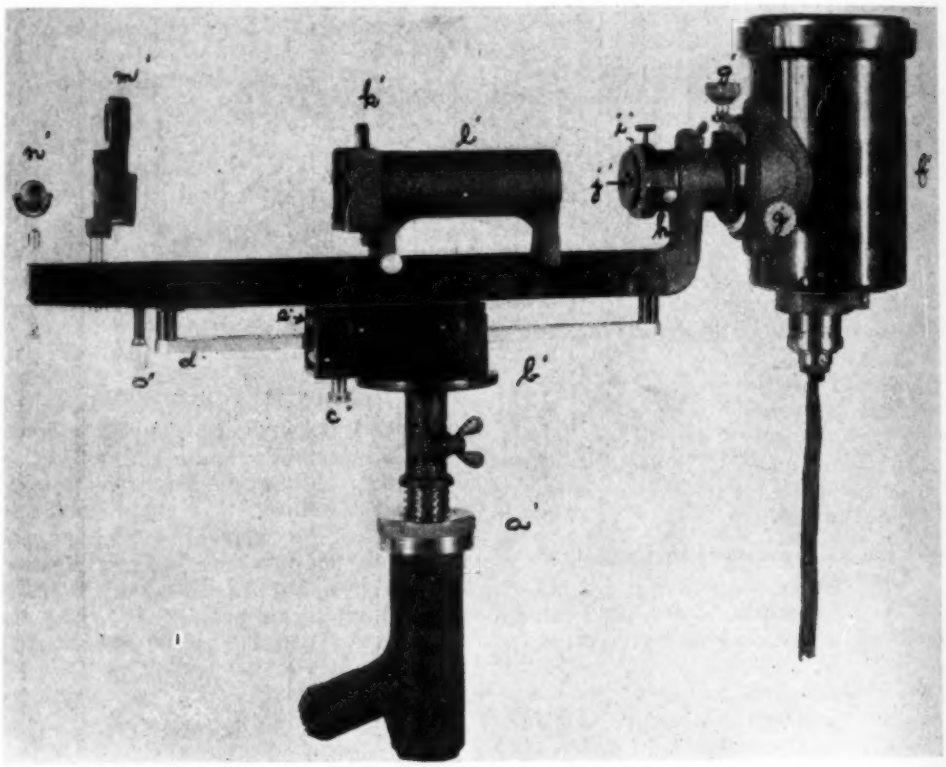


Fig. 1. The component parts of the lighting unit.

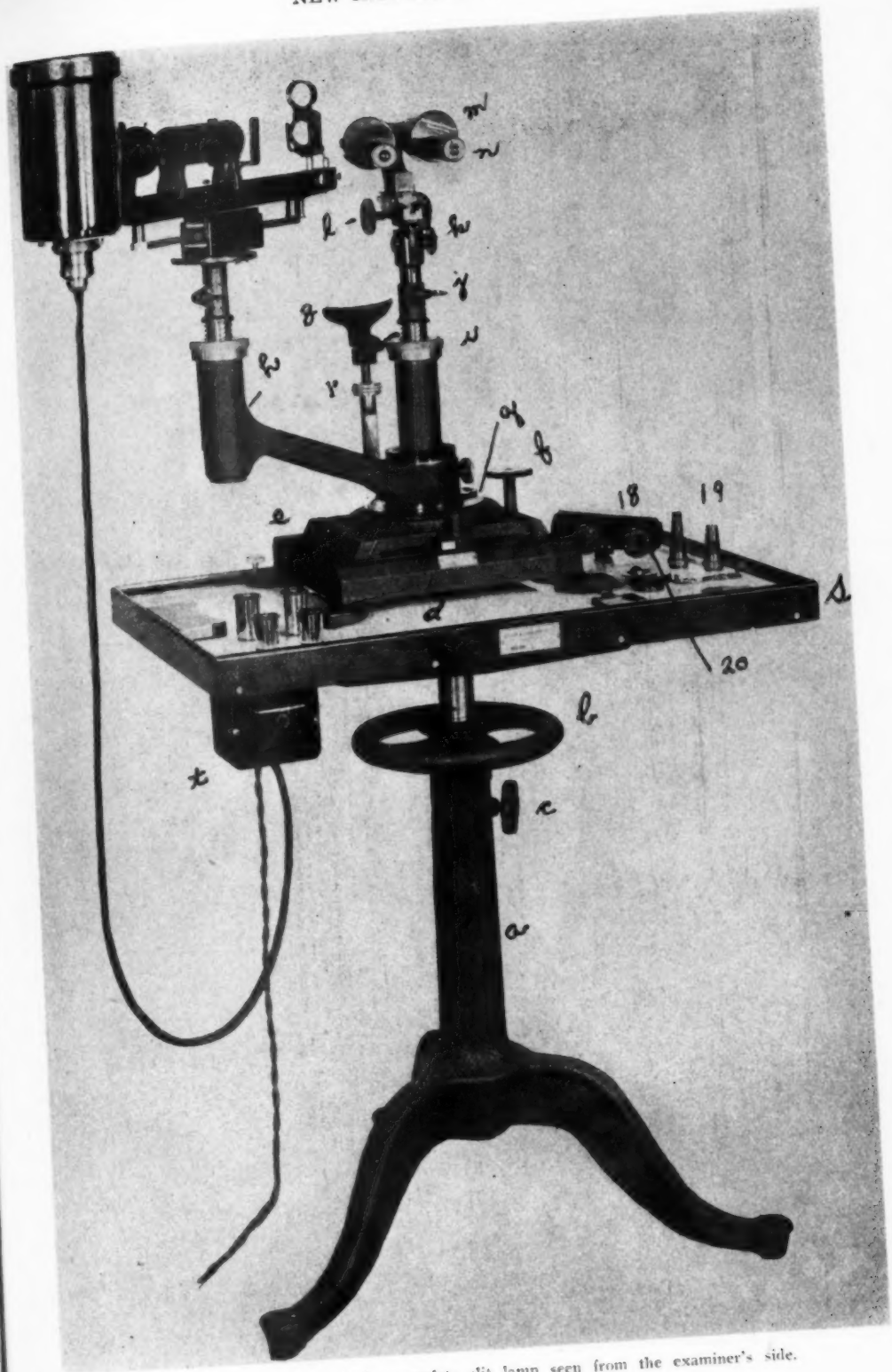


Fig. 2. One form of the complete slit lamp seen from the examiner's side.

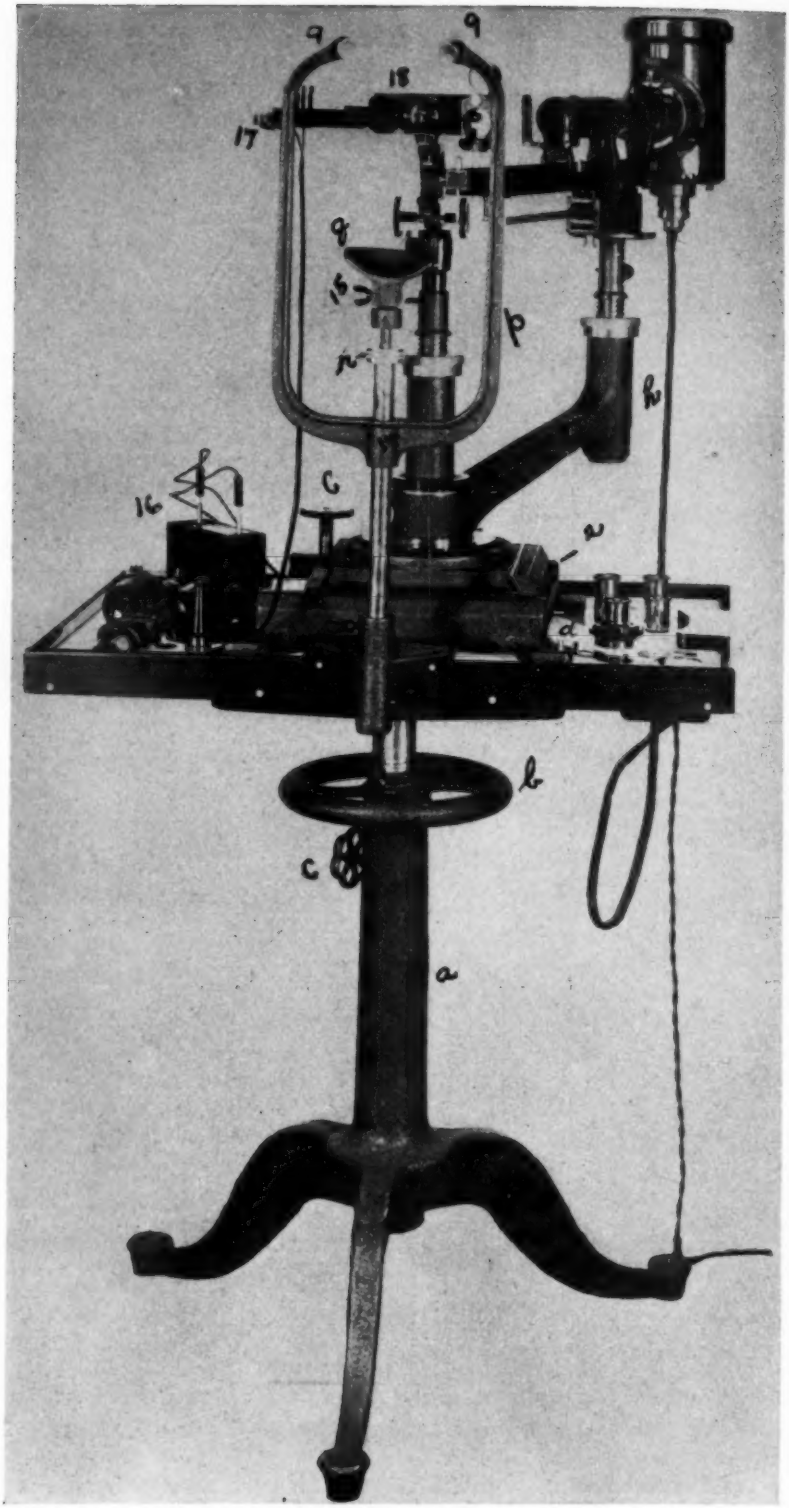


Fig. 3. The same instrument as illustrated in Fig. 2 with head rest in position. Viewed from the patient's side.

possible to place the mirror in any position; *o*, the fine adjustment for focusing lens *m*.

Fig. 2 and Fig. 3. The Complete Instrument.

a a heavy table with three firm metal legs, *b* the elevating wheel, *c* the set-tilting angle, *l* the fine adjustment for the microscope which is mounted in a dovetailed slide, *m* the binocular microscope with matched oculars *n*, *o* the two metal discs mounted on a ball and socket joint in the metal frame *p*. The chin cup *q* on the adjustable rod adjusted by *r*, the

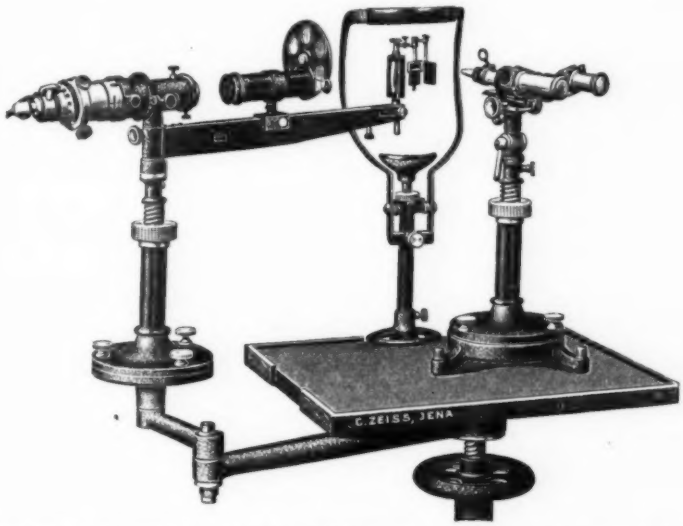


Fig. 4. The other type instrument in which the lighting unit is on a separate compound arm, and the Koeppe microscope supported by four feet on a glass top table.

screw, *d* the glass top on which is placed the compound slide *e*, which is controlled by thumb screws *f*; *g* the dial marked in 360° about which the light unit *h* revolves, *i* the elevating screw for the microscope, *j* the tension screw of the microscope, *k* the screw that controls the whole apparatus clamped to the table *s*. *t* the rheostat fastened to the table. 16 the storage battery connected to the fixation apparatus 17 used in conjunction with the Koeppe microscope 18. 19 single objective for the Koeppe instrument, semiaperture diaphragms 20.

Fig. 5. The arc lamp as a separate unit. The microscope mounted on a compound slide.

Figure 4 shows the type instrument in which light and microscope are separate. The letters refer to the same parts as shown in figures 2 and 3. *u* the Koeppe disc of light filters. *v* the radius bar on which is suspended and rotated the light unit in one form of the instrument. It will be noted that this bar rotates on the upright of the special table and with this table action can be placed in any position and does not move when the microscope unit is focused; *w* the Koeppe silvered mirror attached to the *y* Vogt table. 4 Vogt silvered mirror connected with 5 the Vogt focusing lens.

Fig. 6. The same instrument as shown in Fig. 4, except that the microscope is binocular; and the silver mirror combination is not attached to the Vogt lens.

Figure 5

6 the arc lamp. *7* the adjusting screw which brings the carbons in contact in the arc light housing. The clockwork lens, *1* the adjusting screw on this form of head rest, tightening it throws the forehead away from the microscope. 2 the binocular single objective microscope of Koeppe. 3 the movable microscope base which slides on the glass top

Fig. 7. The Vogt lens and silver mirror in position.

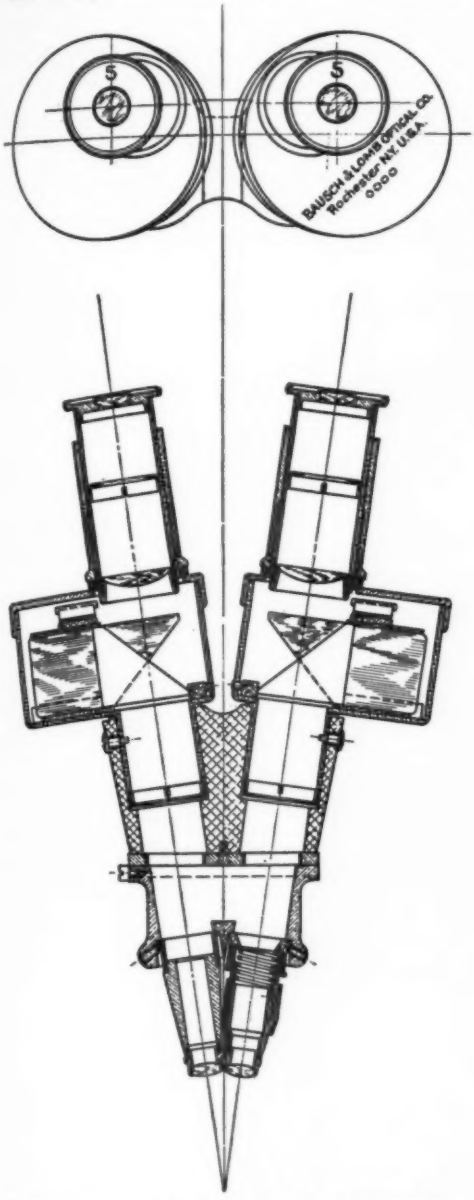
10 is wound from the opposite side. 8 the chin rest. 11 the water cooler.

Figure 6.

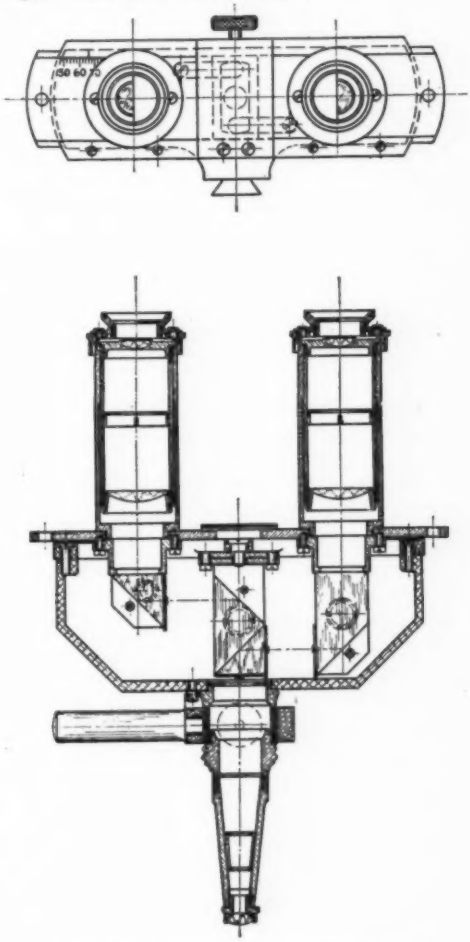
A detailed view of the biocular *m* microscope showing the paired *n* oculars, paired objectives 12 mounted on a plate which can be easily removed and others inserted. A fine adjustment screw *l*. The fine screw *o* controls the position of *m* the condensing lens. The angle finder 13.

Figure 7.

In two instruments the light unit is separate and swings on a double radius bar *w*. In one the microscope is mounted on the same compound slide that is used in Fig. 3, in the other the base of the microscope is on the glass top table Fig. 7. In these two forms it is necessary to make a separate adjustment of the light and the microscope.



BINOCULAR MICROSCOPE
FOR
STEREOSCOPIC OBSERVATION
WITH
PAIRED OCULARS AND OBJECTIVES
Fig. 8.



BINOCULAR MICROSCOPE
FOR
VITREOUS AND FUNDUS EXAMINATION
WITH SINGLE OBJECTIVE
Fig. 9.

In the microscopic study of the living eye the beginner should only use the low magnifications; after the technic is mastered he can use the higher powers, but never to the exclusion of the low.

METHOD OF EXAMINATION.

The room must be darkened, and for the fundus work absolute darkness is essential. The instrument table is kept at a fairly constant elevation. The stool on which the patient is placed is adjusted so that when he faces the instrument, his chin is comfortable in the chin rest and his forehead firm against the support. It may be necessary to move both 8 and *p*, for the distance between chin and forehead varies so much that an individual adjustment is necessary for each patient. The position of the patient's eye may be regulated by movement of *r* which changes the level, raises or lowers the head.

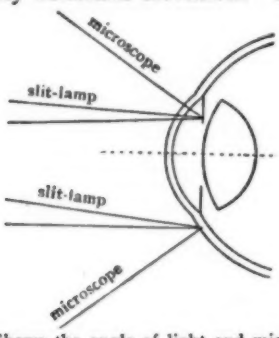


Fig. 10. Shows the angle of light and microscope for the direct light examination of iris and conjunctiva.

The patient must be comfortably placed if the examination is to be prolonged; otherwise he will be unduly fatigued and will not be able to cooperate with the examiner. The light unit is adjusted by movements of screw *a*. The microscope unit is then adjusted, the light is turned on and finer adjustments made, either by moving the whole instrument, Fig. 2, or by moving the microscope and the light separately, as in Fig. 7. In examining the right eye, the left hand of the examiner moves the metal bar supporting the light unit and the left thumb and forefinger are placed on *o*, the right thumb and forefinger are on *l*, by moving both thumbs and forefingers, the light is accurately focused and seen as a slit on the part under examination. When the left eye is examined the operator grasps the light unit with his right hand and adjusts the microscope with his left. When the light arm and microscope are on the same base, it is possible to examine on a horizontal plane with little adjustment.

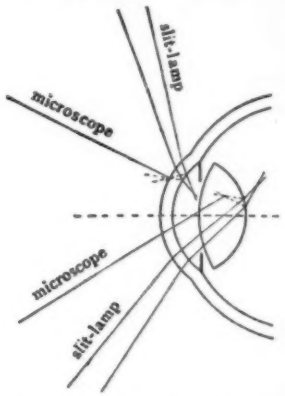


Fig. 12. The cornea and lens by reflected light.

When the lamp and microscope are separate units, the light is adjusted with the left hand as described. The microscope may be loosened at *j* and be moved by the examiner's forehead across the field of observation, as the light is car-

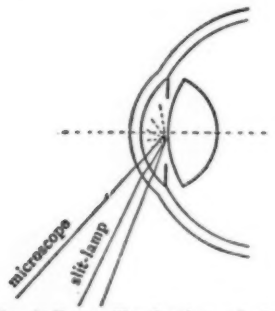


Fig. 11. The indirect illumination of the aqueous.

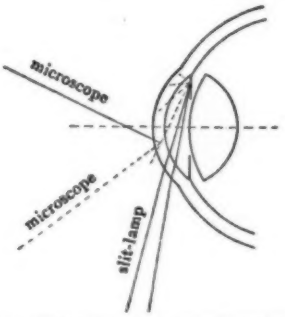


Fig. 13. The cornea by transillumination.

ried from one part to another. By noting the position of the eye in relation to the instrument and the position of the light and microscope a lesion may be relocated. The angle between light and microscope is measured in two ways; in one the attachment 13 is on the light unit arm, in the other there are two circles *f* with index *l* on the rotating axis of the illuminator *b* and the other on the base of the lever arm *g* which is fitted to the vertical pillar of the microscope.

Examination may be by direct light, by transillumination, by reflection or indirect lateral illumination and with a steady or oscillating light.

The conjunctiva should be studied first so that the examiner can see the dif-

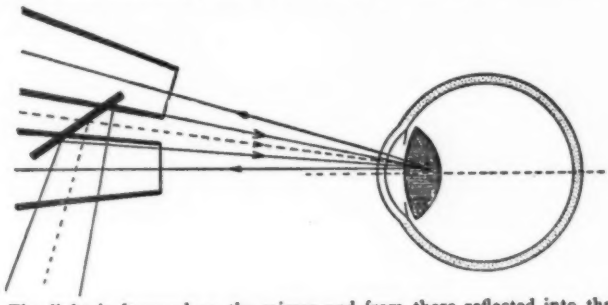


Fig. 14. The light is focussed on the mirror and from there reflected into the lens.

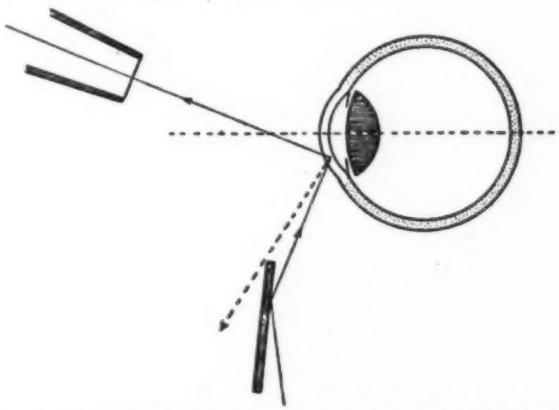


Fig. 15. The light reflected from the mirror and examination made with the single objective.

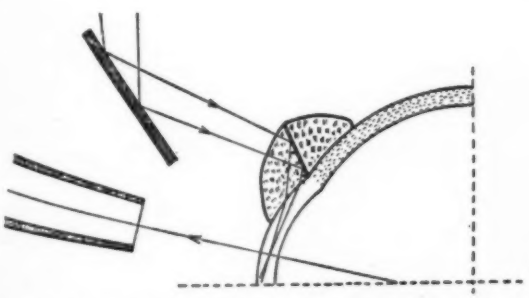


Fig. 16. Transillumination thru contact glass, the light being reflected to the mirror and from the mirror to the contact glass and then into the field under observation.

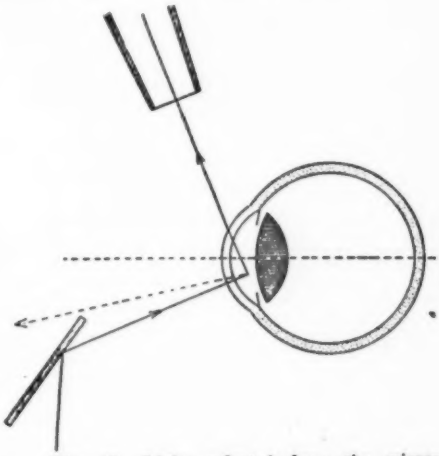


Fig. 17. Light reflected from the mirror into the aqueous. Observation with single Koeppe tube.

ference between direct and indirect illumination. Then the iris is illuminated so that the observer may become familiar with stereosocopic effects. The pupillary angle of the anterior chamber can only be done after contraction of the pupil and the use of a contact glass. These contact glasses are of two forms, the one

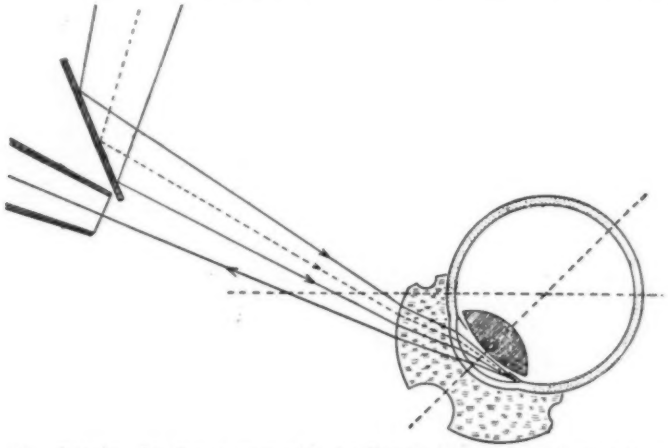


Fig. 18. Anterior chamber as seen with the Koeppe instrument and contact glass.

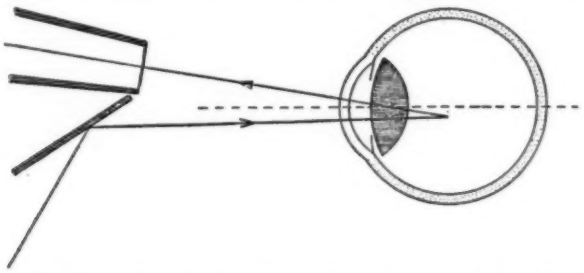


Fig. 19. Direct examination of vitreous with mirror and single objective.

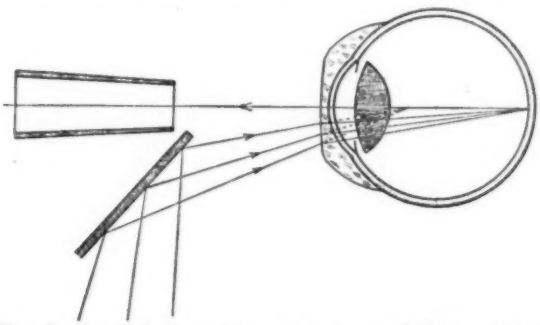


Fig. 20. Examination of fundus with contact glass and Koeppe instrument.

distance of the individual operator must be adjusted. This is accomplished by the separation of the oculars *n*, always remembering that the focal pencil of light must be accurately focused. See figures 8 and 9. Too much time cannot be devoted to this detail.

To examine the lens and vitreous, the pupil must be dilated. The study of the for the study of the retina, optic nerve and deep vitreous and the other for the examination of the interior of the anterior chamber.

The slitlamp assists the trained observer to see normal and pathologic changes in the eye, that cannot be seen in any other way. The importance of this instrument in the examination of eyes

that have been injured cannot be overemphasized. With it the five layers of cornea and the corneal nerves are easily demonstrated. The minute structure of the socalled Descemet's deposits is carefully observed and blood vessels are readily located. The position of a corneal scar and the presence or absence

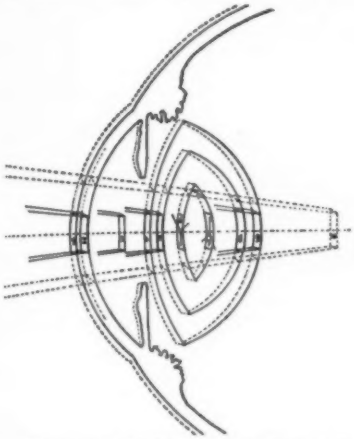


Fig. 21. Diagram indicating the position of the focal slit images.

1. On the anterior surface of the cornea.
2. On the posterior surface of the cornea.
3. On the aqueous humor.
5. On the anterior surface of the lens.
5. On the anterior senile surface of the nucleus.
6. On the anterior and
7. On the posterior embryonic nuclear layer.
8. On the posterior senile nuclear layer.
9. On the posterior lens surface.
10. Within the vitreous humor.

of pigment in it, as well as the actual demonstration of a foreign body such as a minute piece of glass, is of supreme value to the careful diagnostician. The increase in the number of cells that float in the aqueous, the appreciation of their movements and the change in their characteristics, cannot be seen with so much detail by any other method.

There is an infinite variety of congenital and acquired iris changes which, altho visible with a loupe, have a new meaning when studied with this instrument. It is also possible to differentiate many lens changes; the socalled senile opacities, the congenital types and the complicated posterior cortical lesions. The vitreous can be seen, also changes in its framework, the massing of fibrils, the absorption of some of the supporting fibers and the presence of the supporting erythrocytes and various forms of pigment. The study of the retina shows

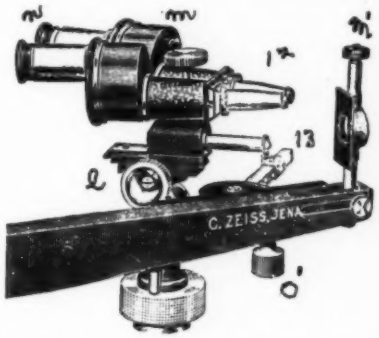


Fig. 22. Angle finder to be used on the separate illuminator arm.

that early diagnosis may be made between a simple detachment of the retina and the form resulting from an underlying tumor. To differentiate between a choked disc and an optic neuritis is now possible, by using the contact glass and the Koeppe microscope.

With all these advantages it is easy to understand why much has appeared in the literature in the last few years regarding this instrument; but it is hard to explain why so valuable an adjunct to ophthalmology has been condemned by some and only passively accepted by others. Fortunately many have received it with enthusiasm. It is essential to understand that the instrument is of the greatest clinical value as well as offering to the laboratory worker a wonderful assistant in carrying on investigations in the living eye. Anyone who masters the technic and uses the instrument in routine examinations will soon admit that it is indispensable.

American Journal of Ophthalmology

Series 3, Vol. 8, No. 2 February, 1925

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY

Original papers, correspondence, and other scientific communications should be addressed to the Editor. Books for review may be sent to any member of the editorial staff. Reports of society proceedings should be sent to Dr. Harry S. Gradle, 22 E. Washington St, Chicago, Ill.

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OPACITY IN THE CRYSTALLINE LENS.

A good deal is known of the causation of cataract. But there remain gaps in our knowledge of it, that greatly limit the practical value of the isolated facts we do know. A large amount of work has been done on investigations of opacity of the crystalline lens; but until it is supplemented by a better understanding of the physical changes that cause loss of transparency, laboratory experiments on the physiology and pathology of the crystalline lens may remain unfruitful.

The differences in structure between the transparent cornea and the opaque sclera seem rather insignificant, as they appear under the microscope. The physical difference between transparent and opaque substances is in the uniformity of the index of refraction of the former. Many crystalline substances are transparent, altho the same chemical combinations are also widely known in opaque forms. Yet, crystals found in the crystalline lens cause a form of cataract.

Many liquids are transparent, and solutions they form with opaque substances are also transparent. The aqueous humor and tears are examples. The opacity caused by "precipitation" of such substances, as of albumin dissolved in the acqueous humor, or in urine, is a familiar opacity produced in such solutions. In the body, the transparent tissues may be regarded as colloidal solutions.

The "membranes" of Bowman, Descemet and Bruch are familiar instances in the eye. Possibly, the closer study of changes that lead to opacity in these membranes, might throw light on similar changes in the crystalline lens. The crystalline lens arises from epiblastic cells as do these membranes. The conditions and chemistry of colloid degeneration offer a source of possible knowledge bearing on crystalline lens transparency. The process of dialysis separating colloids from crystalloids is interesting in this connection. Colloids form the basis of organic fibers like epidermal hairs, silk, spider web, etc. Gelatin seems to be a modified form of colloid that might have analogies to the fibers of the crystalline lens, and might properly be made the subject for experiment in a chemico-optical investigation.

The application of the microscope to the study of the crystalline lens in the living eye, with the help of an in-

tense sharply limited beam of light, gives us a new means of investigation of lens opacities; and makes it particularly important at this time to study the early development of lens opacities. On examination with the microscope and strong illumination, every crystalline lens shows opacities. It must be determined by the repeated examinations of many observers, which of these may be at once set down as probably normal, which are to be regarded as suspicious and kept under observation, and which give such ground to fear their increase as to justify the trial of various lines of treatment to control such a tendency.

The benefit from any suggested method for treating partial cataract must be checked up by observations with the microscope. It can best be judged by the effect produced on small opacities, while the bulk of the lens substances is still clear enough to permit accurate observations thru it. Such a study of the effects of dionin, potassium iodid, and subconjunctival injections of mercury cyanid, might yield definite indications for their use. But their real practical value, in this connection, can only be known, when sufficient observations on the natural course and progress of the lens opacities that come on with age, have been sufficiently studied. E. J.

MINERS' NYSTAGMUS.

In the discussion of miners' nystagmus, published in this number (p. 144), the fact that theories most commonly held with regard to the causation of this disease are unsatisfactory, was stated; and received support from the divergence of views with regard to causative factors. Fergus called attention to the wide involvment of the nerve centers and reduced vision, along with the nystagmus; the difficulty of diagnosis from other general diseases of the central nervous system; the pain in the back of the head, not satisfactorily explained, which might connect the poor vision with disease of the occipital cortex. It is the cerebral centers that are involved, but not the medulla or pons. The condition is not due to poor illumination or to posture in working. He even suggested it might be caused by microorganism.

Robson, from his experience among the miners of Wales, concluded that it was a general disease, not local. In some mines it is the men that work on a particular seam of coal who are affected. It depends on something in the environment; and not on any personal idiosyncrasy, as any condition caused by fatigue would be likely to do. In New South Wales, it occurred in the deep mines, where the coal was likely to undergo spontaneous combustion, while in the well ventilated mines of America it did not occur. There is no evidence that the use of strong electric head lights in the workings have caused any steady reduction in the disease; altho, as Thomas points out, these give one hundred times stronger illumination.

Cridland cites the long known fact that nystagmus does not often occur in workings lighted by candles, but is associated with the use of the miner's "safety lamp." The safety lamp was invented by Sir Humphrey Davy, to prevent explosions started in a gas laden atmosphere by the naked flame of the candle. The lamp allows the miner to work in an atmosphere more heavily laden with gases, than was possible with the naked candle flame. The electric light does the same thing. It is far more brilliant than the naked candle, yet it shares the association with nystagmus that has been noticed with the "safety lamp." Surely, not the poorer illumination but the greater exposure to gas poisoning, is the more probable connection between the lamp and nystagmus.

At the Oxford Congress in 1912, Butler (Ophthalmoscope, v. 10, p. 680) urged that "miners' nystagmus" ought to be called Miners' Neurosis; and suggested it might be due to chronic poisoning by hydrocarbons. At that time comparatively little was known of carbon monoxid poisoning. But since then garage deaths from this cause have become rather common. The group of cases reported by Wilmer (A. J. O., v. 4, p. 73) showed it could be equally dangerous by chronic poison-

ing, could impair vision, and even cause optic atrophy, as well as various cerebral disturbances. The danger line has been carefully investigated in connection with proposed automobile tunnels, especially in New York City. In the present state of our knowledge, this etiology for "miners' nystagmus" ought to be given at least equal attention, with the theories of deficient illumination, or excessive fatigue. The character of gases, present in mines most likely to cause nystagmus, ought to be the subject of close research. It is quite possible that some gas, other than carbon monoxid may share in the poisoning.

The writer, struck by Butler's original suggestion, has had the matter in mind ever since and has not read of any reported feature of miners' nystagmus that cannot be better explained on this hypothesis, than upon either of the older ones that are more widely accepted.

E. J.

THE LONDON CONVENTION.

The full success of the London Convention of English Speaking Ophthalmological Societies depends on the hearty, intelligent cooperation, of many ophthalmologists scattered thruout the world. If its scientific program (see p. 87) is to be the best attainable, there must be offers of papers, demonstrations and museum exhibits, from opthalmologists in all English speaking countries. There must also be careful selection by the Committee on Scientific Business, from among those offered, of a list of voluntary papers that are most likely to be of general interest, and are suitable for presentation in the sessions of such a meeting.

If you have something to offer, send the title, at once, to Mr. R. Foster Moore, 91 Harley St., London, W.1; with information regarding the opportunities for observation or experiment on which the paper is based, the phase of the subject taken up, the new facts or conclusions to which you wish to call attention, and the number of minutes you will require to present the paper, expecting that the time limitation set upon it will be rigidly enforced.

If you already have the paper completed, send a copy of it, upon which is indicated the parts which you think would have to be read. If your paper is not written, it should be completed as soon as possible, with the time limit kept steadily in view. If the subject is a large one, confine the paper to some one striking phase of it. That is the best way to awaken interest and draw attention to it as a whole. Remember you can knock a man down with a hammer, but you cannot puncture his heart with it. You can make him very weary with a long recital of what you have done or observed; but making him tired will not ensure that he will remember what you say, or be much influenced by it. A scientific meeting is for the benefit of the listeners, not for the self exhibition of the speakers.

Again we emphasize that it is desirable to send in the registration fee, two pounds, to Mr. Leslie Paton, 29 Harley St., W. 1, London, as soon as possible. If you cannot go to London, this will bring you the scientific proceedings of the Convention; a volume that will do more than any other one you could get, to put you in touch with the active ophthalmologists of the world and the things they are thinking about in this year, 1925.

If you can go, arrange for passage as soon as possible. It may be possible to arrange for passage up to the last minute; but those who apply first will have the best choice of cabins. No single excursion from America could be arranged to suit the various tastes and times of those who will attend. Some will go after the meeting of the A. M. A., the last of May; others at the last of June, or just in time to reach London by July 13th. The thing to do is to get in touch with the steamship companies, whose addresses are to be found in their advertisements, or in the official railway guide, accessible at any railway ticket office.

What are called "one cabin" or "one class" boats are generally as comfortable and almost as fast as the big liners, and offer a fine opportunity for

travelers to get together. They are run on several lines, especially those sailing from New York and Montreal. As information is sent in, we will notice among the "News Items" what sailing arrangements have been made by American ophthalmologists.

The Interstate Post-Graduate Assembly of America is to meet this year in London in June. We believe a large excursion is being arranged for those who wish to go for that event. Those who can be in Europe at that time, will have the opportunity of attending the joint Congress of French and Belgium ophthalmologic societies at Brussels, May 9-14. (See p. 169). It is now stated, officially, that the German Ophthalmological Congress at Heidelberg will change its time of meeting until August 3-5, after the London Convention, so that attendance at both will be possible. E. J.

A NEW JOURNAL.

THE ARCHIVES OF OTO-LARYNGOLOGY, now being issued, will be to many readers of the American Journal of Ophthalmology the most interesting of the monthly journals now published by the American Medical Association. It has been started after very careful consideration by the Section on Laryngology, Otology and Rhinology and the Trustees and officers of the American Medical Association.

In form it resembles the other special publications of the Association. It gives both original matter and what is of most importance with regard to this branch of practice in the world's medical literature. Under the competent editorial guidance of Dr. George E. Shambaugh and his collaborators, E. A. Crockett, I. Friesner, Chevalier Jackson, Robert C. Lynch and Greenfield Sluder, it is certain to be successful in helping the oto-laryngologist with the problems he must deal with, and keeping him in touch with the advances in practical methods and the fundamental sciences that underlie his work.

E. J.

BOOK NOTICES.

Jahresbericht über die gesamte Ophthalmologie. 49 Jahrang. Bericht über das Jahr, 1922, Prof. **Dr. O. Kuffler.** Paper, 556 pages, Berlin, Julius Springer, 1924.

More than half of this volume is taken up with the annual bibliographies and indexes of the "Zentralblatt für die gesamte Ophthalmologie und ihre Grenzgebiete," the biweekly publication to which this "Jahrbuch" is, in effect, a supplement. The two publications, taken together, give a very complete review of the literature of ophthalmology and its borderland subjects. But the "Zentralblatt" is made up of separate abstracts of the articles noticed; while the digests of the annual volume are much more like the "digests of the literature," which constitute eighty per cent of the Ophthalmic Year Book. For those students, who read German and have become thoroly familiar with the present Zentralblatt and Jahresbericht, the two volume collection of abstracts and this annual index and supplement will be highly valued.

Going on with a comparison of the "Jahresbericht" and "Year Book": A count of lines in the index of authors' names would seem to indicate that the Jahresbericht had about ten per cent. more references than the Year Book, for the same year. But on examing closely, we find R. H. Elliot within two references and Robert Henry Elliot with one, in the Jahresbericht; while in the Year Book, R. H. Elliot, with three references, has but a single line. Under Elschnig, the Jahresbericht gives seven references to Elschnig alone, five to Elschnig, A., and one to Elschnig, Anton. The Year Book gives eleven references to Elschnig, A., and four to Elschnig without an initial. This latter line is necessary, because there is also an Elschnig, H., and where no initial is given, as is common in the literature of continental Europe, it is sometimes impossible to determine which of two writers, having the same family name, is the author. If one counts the individual page references, the Year Book appears to have the larger number.

But this may only be due to a larger proportion of references to society proceedings, many of which are of minor importance.

This comparison of the two publications has been made for two reasons. First: Arrived at thru different organizations, it tests both publications as to the thoroness of the search in the ophthalmic literature of the world for material worthy of being condensed and made available to the mass of the profession; and both stand the test. The appearance of the Year Book a year earlier than the Jahresbericht covering 1922, gives the latter the advantage of work done for the former. But the issue of two numbers of the Zentralblatt each month, gives assistance in the preparation of the Year Book, that largely balances such advantage. The two publications would not agree so closely in references, if both did not present fairly complete surveys of the world's literature.

Second: Before the world war, when Nagel's Jahresbericht had been organized for forty years, and the Year Book less than ten years, loose comparisons were made between the two publications mostly to the discredit of the latter. Now it becomes apparent, that for the special student and author, there is in English about as good a guide to the original sources of literature as in German. But it is a guide that is more condensed and, therefore, is less likely to be itself quoted, instead of sending the writer to the original sources.

Which work is the better practical guide to the reader, who seeks assistance in the care of his cases, may be open to debate, which we shall not here enter upon. In the end, this practical value rests largely on the judgment and skill in expression of the collaborators by whom the digest or abstracts of articles are prepared. We had supposed it would be easier to find, in Germany than in America, writers of highly specialized interest and knowledge to prepare the abstracts and digests for the Zentralblatt and the Jahresbericht. But, altho this volume is divided into forty-five different sections or departments, they seem to have been prepared by only twenty-five collaborators. Thus, several collaborators prepare as many as four sections each, while ophthalmic therapy is treated by two collaborators.

On the whole, the work of these collaborators is well done, showing good acquaintance with the literature relating to their special topics, skill in condensing it and judgment in selecting what is of the most permanent value. Work of this kind is poorly recompensed in either money or fame. But it does give exact knowledge of the subjects treated, and a mastery of language and the art of writing, that is obtained only by the effort of thoughtful study and exact condensed statement.

E. J.

Eye Hazards in Industrial Occupations, by **Louis Resnick** and **Lewis H. Carris.** Paper, 8 vo., 254 pages, tables and 58 ill. Published by National Committee for the Prevention of Blindness, New York City, 1924.

This book, beautifully bound, printed and illustrated, is one of the publications of the National Committee for the Prevention of Blindness, which from the organization in 1915, has sought to bring the eye hazards of industrial occupations and the means of eliminating them to the attention of industry and of the country at large. The writers do not append any titles or degrees to their names; it is assumed that they are not medical graduates but industrial engineers. Reading of the contents shows an exhaustive insight into the medical aspects of eye hazards and injuries.

Mr. Resnick has had wide experience in investigating the accident and health hazards of industries, and Mr. Carris has had direct contact with industry thru his vocational education experience and work in vocational rehabilitation. Many corporations, eye surgeons and authors have placed at their disposal information, photographs and personal services for consultation and criticism of the manuscript.

The book takes up the following subjects: Nature and Causes of Eye In-

juries, Elimination of Hazards by Engineering Revision, Description of Eye Accidents and Means for Their Prevention, First Aid, Correction of Defective Vision, Diseases, Industrial Lighting, Education as to Safety, The Industrial Poisons; and a very careful resumé of the preventative methods, safeguards, tools and rules of many large and small industrial organizations. A reading list is given of the principal publications on the subject from the year 1919; and a well compiled index closes the book.

To the reviewer, who for many years has been especially interested in this subject, the work is extremely valuable and it will be found so to every eye surgeon; for it gives a view from the beginning of eye accidents, of which we mainly see only the result in the temporarily or permanently injured. Eye safety appliances, guards, wearing of goggles, and instruction of working men, are now enforced by law in most of the States. It may be safely said that eye accidents are less commonly seen by the oculist than was the case in previous decades, despite the fact of the great increase in occupations in which the eye might be injured. This undoubtedly is due to the use of safety appliances and the program for the prevention of blindness, the value of which not only employers but also the ordinary workman now generally recognize.

H. V. W.

This book gives a comprehensive and broad view of the importance and causes of ocular injuries; and contains a great amount of detailed information that every practising oculist ought to have at his command; altho it is written for a wider public. It is one of the publications of the National Committee for the Prevention of Blindness that cannot be supplied free. But the price, $1.50 for paper cover and $2.50 for fabrikoid binding, only covers the cost of printing and distribution.

E. J.

Errors of Accommodation and Refraction and Their Treatment. Ernest Clarke, M. D., F. R. C. S., Consulting Surgeon to the Central London Ophthalmic Hospital, etc. Fifth Edition, Cloth, 256 pages, one colored plate, test type and 98 illustrations in text. New York, William Wood and Co., 1924.

This is put out as a handbook for students, and is one of the best books of its class. It is notable that both the leading works of this kind, those that have reached the widest circulation and have done most to give a good basic knowledge of their subject, have been by English authors, altho the attitude of adequate appreciation of the subject has been much more common among American ophthalmologists.

Clarke says in his chapter on eyestrain, "The physician who is called upon to treat a socalled 'functional nerve disorder,' and fails to eliminate the element of eyestrain, fails in his duty both to himself and to his patient, for there is no functional trouble that may not be due to eyestrain." He concludes the chapter thus: "It ought never to be forgotten that credit for forcing the attention of the profession to the importance of eyestrain belongs to Gould of America who brought out his fascinating Biographic Clinics in 1903." In America, Gould had predecessors, Dyer, Thomson, Weir Mitchell, Derby, Wadsworth, John Green, Harlan, Risley and others, whose attitude toward the importance and correction of refractive errors was quite as radical as Gould's, altho not so dramatically expressed. But neither these men nor their students, altho they educated Gould and a host of thoro refractionists, produced any textbook or refraction equal to this, or to the book of Hartridge. There is enough in each of these leading textbooks that is not in the other to make it worth while to be familiar with both.

Particularly in this book of Clarke's, there are various practical things mentioned and discussed in notes, or in the main text, that are often omitted from textbooks on refraction; but which are of real value as throwing light on the main thought, or as giving command of those practical points which are often spoken of as "wrinkles," and which come to the observing with experience. For instance, the relation of refracting angle to angle of deviation,

centrad and prism diopter is explained, bifocal glasses and variable revolving prisms are described. There is a chapter on convergence that gives an excellent summary of the facts of binocular vision. There is a chapter on the ophthalmoscope which includes the account of "retinoscopy."

The ophthalmometer has a brief chapter. The author's opinion of it is that "if used as a servant, and not allowed to become master, the ophthalmometer is one of the most valuable adjuncts to the ophthalmologist's consulting room." Heterophoria and squint take twenty-eight pages for their consideration. Their practical aspects are so closely related to the accommodation and refraction of the eye, that such consideration is very appropriate. The prism test and others for the detection of malingering are given in the chapter on heterophoria.

Cycloplegics, methods of examination and note taking, and spectacles, each have a chapter; and one of eight pages is devoted to illustrative cases. The final chapter, XX, deals with vision tests for the services—the army air force, navy, India service, home civil service, metropolitan police, and English railways. There is a large amount of information condensed in this small volume; and it is clearly expressed and readily accessible thru table of contents, index arrangement and heading of paragraphs.

E. J.

Sur les Lesions de l'Appareil Visuel dans les Guerres Balkanique, 1912-1919. Dr. C. Pacheff, Professor of Clinical Ophthalmology in the Faculty of Medicine in the University of Sofia. Paper, 8 vo., 152 pages, 18 plates giving 116 illustrations.

In the series of annual publications emanating from the Faculty of the University of Sofia, is this, from the youngest faculty of the University, that of medicine. Being written in French, it will have a wider reading than it would have had in Bulgarian. It is, essentially, as its author calls it, a small atlas; very unassuming and inexpensive, as compared with others of the kind that came from the World War and have been noticed in this journal. But for wealth of experience recorded and for pruning out of unessential observation and comment, it compares well with any of the others.

After less than two pages of preface and introduction, it takes up the anterior segment—lesions of the cornea, iris and crystalline lens. Then come the lesions of the posterior segment—macular, papillary and peripapillary; and after them, contusions due to compression of the air, of which three cases are reported. The perforating lesions of the eyes are classed under those of aseptic foreign bodies, septic foreign bodies, the chemical effects of intraocular metallic foreign bodies and complete destruction of the eyeball.

About one-half of this monograph is occupied with, lesions of the optic tracts and centers, of the motor apparatus of the eyes, the retrobulbar vessels and the endocrin glands. Those of the visual tracts are considered under optic nerve, chiasm and centers. Those of the motor apparatus are divided into ocular, orbital, cranial and the cervical sympathetic. Under vascular lesions, we find cases of pulsating exophthalmos, and embolism of the central artery of the retina. The endocrin lesions include those of the thyroid and the pituitary body.

In the bibliography appended to the book, out of the thirty-five titles, thirty are of publications dated since the beginning of the war. Pacheff has built on the most recent published experience of others. The plates are not remarkable for symmetry or beauty. But every illustration tells a story. Pathologic conditions, points of impact and fields of vision are all portrayed. This is a contribution of real value to the history of war injuries.

E. J.

Queratitis Vesiculosa. Ribas Valeros, Adjunct Professor of Ophthalmology of Seville. Paper, 8 vo., 55 pages. Seville, F. de Castro.

Under this heading of vesicular keratitis are taken up corneal herpes, dendritic, filamentous and superficial punctate keratitis, and herpes zoster involving the cornea. This mono-

graph is devoted to the clinical aspects of the disease, the discussion of pathogenesis being chiefly speculative and theoretic. E. J.

Ear, Nose and Throat Treatment in General Practice by **Georges Portmann**, M.D., Professor Agrégé of Oto-Rhino-Laryngology, Faculty of Medicine of Bordeaux. Translated and Edited by R. Scott Stevenson, M.D. 180 pages. Published by C. V. Mosby Company, St. Louis, 1924.

This translation of Dr. Portmann's book gives an outline of the diseases of the ear, nose, and throat. Very little attention is given to diagnosis or prognosis, the text being in reality a summary of the medical and minor surgical treatment.

A very great number of prescriptions are set down to be used in the various diseases, and therapeutic procedures are described in detail. In fact it would seem to the American oto-laryngologist astounding that a confrére in this specialty should have at his command so many combinations of drugs.

The special appeal of this text is in relation to the pharmacologic treatment of diseases of ear, nose and throat.

J. H. HARTER.

CORRESPONDENCE.

The Lens in Accommodation.

To the Editor: Reading the comment of "C. L.," on the W. H. Bates book, prompts me to write you concerning the case of Traumatic Aniridia which I have reported in the December number (p. 950). In this patient the lens is clear and can be seen in its entire circumference. It is interesting, while watching the crystalline with a strong plus lens, to ask the patient to look alternately across the room and at his own finger, a few inches in front of him; and to see the lens distinctly and markedly increase its curvature in the act of accommodation.

I wish that earnest seeker of "facts," W. H. Bates, M.D., could examine this eye; provided, of course, he knows how to use the ophthalmoscope.

Sincerely

JOHN R. ROGERS.

Grand Rapids, Michigan.

An Inexpensive Magnet.

To the Editor: If you will recall it, in 1894, when I was on the staff of the Wills Eye Hospital, I assisted you in an attempt to extract a piece of iron from the vitreous of an eye with a magnet. You opened the vitreous and having at your command a very weak magnet, the long point of which you

Fig. 1. Home made electric magnet for use on house current.

passed into the vitreous—made an unsuccessful attempt to get the metal. With this suggestion in my mind, a year later I had come to my office in Carlisle a man from the Waynesboro shops with quite a large piece of steel inside the left eye. I consulted Drs. Mohler and Stephens, of the Scientific Department of Dickinson College, relative to a magnet. They said at once that they could construct one, and did, at the expense at that time of a dollar and a half, a photograph of which I enclose, which was taken last week. I have had this magnet at my command these twenty-five years. It can be used by simply attaching to any direct current electric light socket. Before using it the first time, Dr. Stephens made an opening in the skin of his hand and placed a piece of steel under the skin, which the magnet drew thru the skin. I enclose an item which was written about a year ago in defense of this magnet, and anticipating the use of the magnet all these years, against

the claims set forth that the use of the magnet in extracting metal from the body was a product of the recent war. I thought this might be an interesting item for your journal.

Very sincerely yours,

S. SNIVELY BISHOP.

Carlisle, Pa.

Iris and the Trephine Opening.

The Editor: In preparing my Digests of Glaucoma Literature for the Ophthalmic Year Book, my attention was directed to Colonel Herbert's remarks, as quoted at the foot of page 377 of Vol. VII (May 1924) of your journal. I have waited to see the official account of those remarks in the proceedings of the Royal Society of Medicine, before making any comment on them. In Vol. XVII. No. 3, page 30, of those proceedings (August 1924) the following passage occurs "Lt. Col. Herbert (in reply) said that possibly he went too far in saying that the average trephine hole contained iris; but he *merely accepted Colonel Elliot's admission in his recent 'Treatise on Glaucoma.'*" (The italics are my own.)

My views on this subject have been uniform and consistent from the first; and are so clearly expressed in my book to which Colonel Herbert refers, that I venture to quote part of the first paragraph of page 604 to which I have nothing to add, and from which I have nothing to abstract: "Lagrange and the author have from the first contended that an iris-free cicatrix is the end and aim of the surgeon's effort, that the entanglement of uveal tissue is a misfortune, and that clinical experience has proved these points up to the hilt. It is necessary, however, to pause for one moment to point out the difference between a *clinically* iris-free scar, and the same condition *anatomically*. The latter must be very rarely met with, the former can be attained very frequently by the adoption of a correct technique."

I venture to think that comment is needless.

Yours truly,

R. H. ELLIOT.

London, England.

Correction.

To the Editor: I notice in the November number of the AMERICAN JOURNAL OF OPHTHALMOLOGY under News Items, you state in the notice of the death of Mr. George Oliver, of Bradford, that he was formerly lecturer in Ophthalmology, University of Oxford. Mr. Oliver never held any teaching post or had any connection with this University, except that he obtained the Diploma of Ophthalmology some years ago.

Yours faithfully,

P. H. ADAMS.

Oxford, England.

(The incorrect statement was copied from a British exchange. Ed.)

NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply news from their respective sections: Dr. Edmond E. Blaauw, Buffalo; Dr. H. Alexander Brown, San Francisco; Dr. V. A. Chapman, Milwaukee; Dr. Robert Fagin, Memphis; Dr. M. Feingold, New Orleans; Dr. Wm. F. Hardy, St. Louis; Dr. Geo. F. Keiper, LaFayette, Indiana; Dr. George H. Kress, Los Angeles; Dr. W. H. Lowell, Boston; Dr. Pacheco Luna, Guatemala City, Central America; Dr. Wm. R. Murray, Minneapolis; Dr. G. Oram Ring, Philadelphia; Dr. Chas. P. Small, Chicago; Dr. John E. Virden, New York City; Dr. John O. McReynolds, Dallas, Texas; Dr. Edward F. Parker, Charleston, S. C.; Dr. Joseph L. McCool, Portland, Oregon; Dr. Richard C. Smith, Superior, Wis.; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. G. McD. Van Poole, Honolulu; Dr. E. B. Cayce, Nashville, Tenn.; Dr. Gaylord C. Hall, Louisville, Ky.; Dr. Edward D. LeCompte, Salt Lake City.

DEATHS.

Dr. J. Sothoran Keech, Racine, Wisconsin, age sixty-one, died November 19th, of heart disease.

Dr. Edwin R. Westcot, Manistique, Michigan, age fifty-six, died October 31st, following a long illness.

Dr. Stephen D. Harrison, Elmira, New York, age sixty-nine, died November 21st, from a cerebral hemorrhage.

Dr. Anna Odell, Detroit, age fifty, died in November from injuries received in an automobile accident.

Dr. Edward L. Williamson, Assistant

Oculist to the University of California Infirmary at Berkeley, died on December 12th, aged sixty years.

Dr. William Koenig Spiece, of Chicago, died of pneumonia, November 29, 1924, aged fifty-two years.

SOCIETIES.

A combined medical conference of the British Medical Association of China and Hongkong and the China Medical Missionary Association was arranged to be held at Hongkong, January 21-28, 1925. Dr. Howard of Peking was elected Chairman of the Eye Section, for which a program of two days had been arranged.

The Kansas City Eye, Ear, Nose and Throat Society held a very successful meeting at the close of the year on December 18, 1924. Papers were read by Dr. A. J. Lorie on "Lateral Sinus Thrombosis," Dr. O. J. Dixon on "Non-Ligation Method in Thrombosis," and by Dr. E. J. Curran on "Influence of Light and Accommodation on the Flow of the Aqueous of the Eye." Discussion of this latter paper was opened by Dr. J. G. Dorsey of Wichita, Kansas.

At the November meeting of the Ophthalmological-Oto-Laryngological Section of the Cleveland Academy of Medicine, Mr. M. Luckiesh, director of the Lighting Research Laboratory of the General Electric Company, gave a lecture on "Light" with a lantern slide demonstration. The election of officers took place at this meeting and Dr. E. W. Garrett was elected chairman and Dr. M. P. Motto, secretary.

At the October meeting of the Section on Ophthalmology and Oto-Laryngology of the Cleveland Academy of Medicine, papers were read by Dr. Wm. Evans Bruner on "Pituitary Tumors," and by Dr. Wm. B. Chamberlin on "The Gradenigo Symptom Complex." General discussions followed. The chairman, Dr. R. B. Metz, presented a very interesting case report of "A Hypophyseal Tumor" recently seen by him in the ophthalmologic department of the Lakeside Hospital.

The regular meeting of the Ophthalmic Section of the St. Louis Medical Society was held in the medical society building, 3525 Pine street, on December 12, 1924, at 8:30 p. m. The following scientific program was given: 1. Neuropathic Conjunctivitis, Case Report, Dr. W. E. Shahan; 2. Operative Treatment of Paralytic Strabismus With Report of Two Cases, Dr. Meyer Wiener; 3. Traumatic Monocular Color Blindness, Dr. J. E. Jennings; 4. Eye Symptoms Following Section of the Superior Cervical Sympathetic, Case Report, Dr. B. Y. Alvis. Twenty-seven members of the section attended this meeting and many of them participated freely in the discussion of the papers.

On Thursday, December 18, 1924, the Section on Ophthalmology of the College of Physicians of Philadelphia held a meeting. The program was as follows: Dr. Warren S. Reese (by invitation) 1. "Exhibition of a Case of Pseudo-Neuritis." 2. "Exhibition of a Squint Case Operated on by the Recession Method." Dr. J. Milton Griscom and Miss Margaret M. Monroe (by invitation), "Visual Field Studies in a Case of Optic Neuritis Secondary to Sinus Disease." Lantern Demonstration. Dr. Luther C. Peter, "Two Cases of Vitreous Hernia, Traumatic Origin." Presentation of a Case. Dr. Hunter W. Scarlett, "Exhibition of a Case of Projection of New Vessel Formation into the Vitreous."

THE BRUSSELS MEETING.

To strengthen the cordial relations existing between Belgian and French oculists, the Société Belge d'Ophtalmologie has invited the Société Française d'Ophtalmologie to hold its next annual congress at Brussels on the 9th to 14th of May, 1925. A general invitation has been extended to participate in the proceedings of the congress. All who can do so are asked to inform Dr. Danis, Secretary, 7 Rue Montoyer, Brussels, Belgium, as soon as possible.

The President of the organization is Prof. Gallemaerts, the Secretaries, Prof. Van Duyse and Dr. Danis. It will be the Thirty-eighth Congress of the Société Française and held under the patronage of Her Majesty, the Queen of Belgium. The honorary committee includes the French Ambassador, the Ministers of the Interior and of Hygiene, of Sciences and the Arts and of State, the Mayor of Brussels, the Governor of Brabant and Professor J. B. Coppez.

The subscription for the meeting is fixed at 60 Belgian francs. Those making this payment will participate in the different festivities, including the reception of the Société Belge for members of the congress and will receive the transactions of the meeting. Various excursions will be organized for which the prices will be announced. One of these on Sunday, May 10th, will be to Bruges with a visit to the museum and a trip on the canal. Monday, May 11th, there will be an excursion to Malines with a reception in the gardens of the Archbishop and a concert by the chimes. The sessions will take place in the Palais des Academies where there will be an exhibit of instruments and pharmaceutical products. An especial program will be arranged for the ladies.

PERSONALS.

Dr. Joseph L. McCool of Portland was a San Francisco visitor during December.

Dr. Frederick W. Derby, of Boston, has been recently appointed to the position of ophthalmologist to the City of Boston Health Department.

Dr. John F. Barnhill was recently elected president of the Indianapolis Ophthalmological Society, Dr. William F. Molt, vice president, and Dr. Robert E. Repass, secretary.

Dr. John C. Bossiday, formerly of Boston, announces that he has resumed practice with offices at 317 Main street, Springfield National Bank building, Springfield, Massachusetts.

Dr. George E. de Schweinitz, of Philadelphia, who has recently retired from the professorship of Ophthalmology in the University of Pennsylvania, has just been elected a mem-

ber of the Board of Trustees to succeed Dr. Robert G. LaConte.

Dr. Harvey J. Howard returned to Peking in September with his family, after a year's furlough in America and Europe. Dr. Howard resumes his work as Professor and Head of the Department of Ophthalmology in the Peking Union Medical College.

By invitation Dr. Harry S. Gradle, of Chicago, presented a paper before the meeting of the Section on Ophthalmology of the New York Academy of Medicine, December 15th on "Telescopic Spectacles and Magnifiers." A general discussion followed.

Dr. H. T. Pi, who has the rank of Senior Assistant in the Department of Ophthalmology of the Peking Union Medical College, left Peking in August for a year's study in Vienna. He will spend most of his time with Professor Carl Lindner of the Poliklinik, and Dr. A. Fuchs, Privat Docent in the Algemeinerkrankenhaus of Vienna University.

MISCELLANEOUS.

Under the will of Miss Ellen S. Bacon of Jamaica Plains, Massachusetts, $5,000 was bequeathed to the Perkins Institution and Massachusetts Home for the Blind.

The Brooklyn and Summit Homes for Blind Babies of the International Sunshine Society, Brooklyn, New York, were bequeathed $10,000 by the will of the late Edwin Gould.

The new building of the Baltimore Eye, Ear and Throat Charity Hospital was formally opened November seventeenth. In addition to the operating rooms, there are accommodations for twenty-five private patients and an equal number of ward patients. The hospital was established in 1882.

A committee of more than 100 prominent Chicagoans headed by Dr. Frank Billings is working to raise a $100,000 fund with which to establish a monument to Pasteur somewhere in Chicago and to insure a research scholarship, national in scope, which will be open to all.

The old mule-drawn prairie schooners which for years traveled through Kentucky mountains, one a shelter for the surgeon, another for the nurses and the third filled with medical supplies for victims of trachoma, were destroyed by fire November 27. They will be replaced by motor trucks, and where necessary by a train of pack mules. This trachoma caravan stays out for months in the mountains and on the last trip treated 1,246 cases of trachoma.

The Commission for the Distribution of the Prize for Cancer Study founded by Doctor Sofie A. Nordoff-Jung, in agreement with the foundress, has resolved to distribute the prize from now on only every two years to the double amount of the sum allotted heretofore, that is one thousand ($1,000) dollars. The next prize will reach distribution in 1926. This announcement is made by the Department of Biology, Georgetown University, Washington, D. C.

Plans are being made for the establishment at the Johns Hopkins Hospital and Medical School at Baltimore of an institute for the study and treatment of diseases of the eye and for research into the causes of blindness. Should the plans mature, the institute will be under the direction of Dr. W. H. Wilmer of Washington, D. C., and will be named the Wilmer Institute. The Wilmer Foundation is cooperating with John Hopkins in financing the institution which will involve an outlay of three million dollars. Dr. Wilmer will be made the professor of ophthalmology in the medical school and ophthalmologist of John Hopkins hospital. The Wilmer Foundation has already two hundred thousand dollars to contribute to the project. The President of Johns Hopkins University has announced, it is reported, that the General Education Board has made a conditional offer of one million five hundred thousand dollars. The remainder of the three million dollars will have to be raised in order to take advantage of this offer.

Announcement has been made by Dr. George E. de Schweinitz, Dr. Thomas B. Holloway and Dr. G. H. Meeker, Dean of the Post Graduate School of the University of Pennsylvania, that six identical personal courses in Ocular Microscopy with Slit Lamp Illumination, will be given in Philadelphia, between January 5th and March 28th, 1925, by Basil Graves, C. M., of London, England. The first group will extend from January 5th to 17th. The second group from January 19th to 31st. Third group from February 2nd to 14th. Fourth group from February 16th to 28th. Fifth group from March 2nd to 14th and the Sixth group from March 16th to March 28th. Each course will be limited to six ophthalmologists and will be conducted five days weekly for two weeks, one hour lectures and one hour and half daily practice. The fee for the course is $100.00. $25.00 to be paid with the application and the remainder to be paid while taking the course. Several of the groups are already completed. Those wanting further information should consult Dr. Meeker, Dean of the Graduate School of Medicine at No. 80 Medical Laboratories, University of Pennsylvania, Philadelphia.

The American Board of Oto-Laryngology was organized in Chicago on November 10, 1924. The following constitute the board of directors: Drs. Harris P. Mosher, Boston, president; Frank R. Spencer, Boulder, Colo., vice president; Hanau W. Loeb, St. Louis, secretary and treasurer; Thomas E. Carmody, Denver; Joseph C. Beck, Chicago; Thomas H. Halsted, Syracuse, N. Y.; Robert C. Lynch, New Orleans; Burt R. Shurly, Detroit; Ross H. Skillern, Philadelphia; William P. Wherry, Omaha. The office of the board is at 1402 South Grand boulevard, St. Louis, Missouri. The board comprises representatives of the five national oto-laryngologic associations; the American Otological Society, the American Laryngological Association, the American Laryngological, Rhinological and Otological Society, the American Academy of Ophthalmology and Oto-Laryngology, and the

Section of Laryngology, Otology and Rhinology of the American Medical Association. The object of the association is to elevate the standard of oto-laryngology, to familiarize the public with its aims and ideals, to protect the public against unqualified practitioners, to receive applications for examination in oto-laryngology, to conduct examinations of such applicants, to issue certificates of qualification in oto-laryngology and to perform such duties as will advance the cause of oto-laryngology. The first examination will be held at the time of the meeting of the American Medical Association.

Under the will of the late Mrs. Catherine A. Caldwell, $6,848.77 was bequeathed the Brooklyn Home for Blind, Crippled and Defective Children.

The New York Institute for the Education of the Blind, which for ninety-one years occupied the site at Ninth Avenue and Thirty-fourth Street, opened new quarters, November 3rd, in Pelham Parkway at Williamsbridge Road. The new site comprises sixteen acres. Pupils are received at this school from New York and the five counties adjacent and from northern New Jersey. (Jour. A. M. A., November 22, 1924.)

The campaign to eradicate trachoma among the Indians of the Navajo Reservation is in active operation by the Department of the Interior. Twenty-five per cent of these Indians were found to have trachoma. One thousand five hundred fifty-nine operations have been performed. Some of these will have to be repeated, as the primary operation is not always the last word in trachoma. Kuhnt said years ago that resection of the tarsus was the last word. Webster Fox, in his visit last summer to the Indians in the Northwest, did a great many tarsal resections and instructed the government oculists in its technic.

A year ago the National Committee for the Prevention of Blindness began an investigation of accidents to the eyes. The investigation shows that the sight of at least 4,456 men, women and children in the United States has been destroyed or seriously impaired by accidents during the last year. Eighty-five per cent of the victims were men and boys, 25 per cent were children. Industrial accidents constitute the most serious single group. Next to children's play accidents, automobile accidents are the most serious nonindustrial source of eye injuries. Explosives and fireworks rank next. The eyes of 200 children were injured in the Fourth of July celebration.

The ease with which some people are swindled out of large fees by imposters of the medical profession is evidenced by a recent occurrence in Marion, Illinois. A total stranger persuaded the husband that his wife had a serious ocular growth and removed it with radium for $795.00. In a few days two very important looking men drove up to the house and informed the victim that the original medical imposter was dead and that they had been sent around to finish up the job. The gullible husband let them apply some more radium and paid them $1,000. Money must grow on trees at Marion. However, the E. Z. mark became suspicious and found out he had been swindled and is now trying to get the courts interested.

In an analysis of the workmen's compensation cases by the state department of labor, it is reported that injuries to the eyes of employes cost employers in New York, during the year ending June 30, 1923, more than a million dollars. There were 602 cases of permanent injury to eyes of employes, resulting in 54,000 weeks of disability; 12 cases of combined eye and face injuries, resulting in 1,439 weeks of disability, and more than 800 other cases of injury to the eyes, resulting in temporary disability and the amount paid for permanent eye injuries in New York is about one-eighth of the total amount paid for all nonfatal injuries in the industries of the state. The managing director of the National Committee for the Prevention of Blindness, Lewis H. Carris, says that the situation in New York is no worse than in other industrial states.

A training school for dogs as guides for blind invalids of the late war has been established in London. In the school, dogs are trained to lead the blinded men thru crowded streets and to avoid traffic. In the training ground of the school are dummy obstacles such as stairs, wire, stones, holes, bridges, and letter-boxes. After a training of six weeks a dog is, as a rule, able to lead a blind man. To accustom a dog to his companion and vice versa, the blind stay for a fortnight on the premises of the school, where rooms and nurses are provided for them. It is indeed striking—and touching—to see those dogs leading blind invalids safely thru the streets, guarding them from traffic dangers.—*Lancet*, 1924, p. 984.

Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in **heavy-faced type.** The abbreviations mean: (Ill.) illustrated; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is in an abstract of the original article. (Bibl.) mean bibliography and (Dis.) discussion published with a paper.

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FIG. 1—NORMAL FUNDUS SEEN WITH ORDINARY ELECTRIC OPHTHALMOSCOPE.

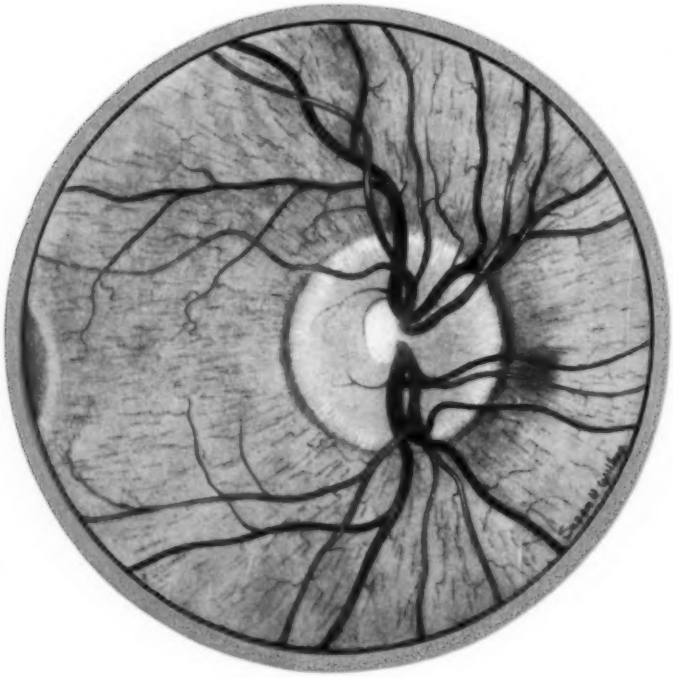

FIG. 2—SAME FUNDUS AS FIG. 1, SEEN WITH YELLOW GREEN LIGHT (FRIEDENWALD).